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County of San Diego
Standard Urban Storm Water Mitigation Plan For Land Development and Public Improvement Projects

1.0 INTRODUCTION TO THE MANUAL

The County of San Diego has established a set of programs to reduce or minimize the potential for stormwater quality impacts where practical in stormwater runoff. These programs address requirements imposed by federal and state law. The County's programs include regulatory programs that address private construction activities and land development project design, industrial and commercial facility operation, and residential activities. The County also conforms its own facility operations, capital improvement project design, and construction projects to these regulatory standards.

The County's regulatory programs for storm water are established in County ordinances, principally the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance **(WPO)**, at County Code sections 67.801 *et seq.* The WPO includes, as Appendix "A," a detailed Stormwater Standards Manual **(SSM)**. The WPO, including the SSM, defines the requirements that are legally enforceable by the County in the unincorporated parts of San Diego County. The WPO will be amended in late 2002 to include new state-mandated provisions for land development projects. This manual reflects those anticipated ordinance revisions.

The County's programs for managing its own facilities and activities, including its capital improvement projects, are set out in the County's Jurisdictional Urban Runoff Management Plan **(JURMP)**. JURMP requirements that parallel County regulatory requirements for private projects and activities are mandatory for County projects and activities.

The County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects (**SUSMP**) is intended to help implement one part of these County programs. The SUSMP only addresses land development and capital improvement projects. It is focused on project design requirements and related post-construction requirements, not on the construction process itself. It dovetails with long-established County CEQA processes and land development review and approval processes, but does not replace those processes. The SUSMP address the WPO and JURMP requirements that apply to these projects, but in case of any inconsistency or ambiguity, the WPO and JURMP, and any project-specific permit conditions imposed by the County, are controlling.

This SUSMP contains definitions of two terms that differ from the definitions of the same terms used in the WPO/SSM: "receiving waters" and "wetlands". These special definitions are used here to ensure compliance with Model SUSMP provisions concerning acceptable locations for structural treatment BMPs for priority development projects. For all other purposes, the definitions of these terms contained in the WPO/SSM are applicable.

The purposes of this SUSMP and the procedures and requirements it contains are:

1. To identify potential stormwater quality impacts from land development, and to develop and evaluate options to avoid, reduce or minimize the potential for stormwater quality impacts where practical;

2. To provide design guidance on effective structural and non-structural Best Management Practices (BMPs) for development sites and County capital improvement projects;

3. To ensure the long-term performance of these BMPs;

4. To ensure that BMPs put in place at land development projects and capital improvement projects meet or exceed applicable regulatory requirements; and

5. To fulfill the state requirement that the County adopt a "Standard Urban Stormwater Management Plan" **(SUSMP)** for imposing specific additional regulatory requirements on "Priority Development Projects."

This SUSMP is intended for use on both large and small projects processed through the County's Department of Planning and Land Use **(DPLU)** or through the Department of Public Works **(DPW)** Land Development section. It is not limited to Priority Development Projects, but distinguishes those projects from other development projects. The SUSMP also applies to County capital improvement projects.

The BMPs and the design criteria described in this manual are based on existing well-established stormwater management technologies and practices. Other BMPs exist, and more will be developed and proven over time. The County encourages the development and use of innovative practices that can better protect and manage storm water. Developers and County staff may propose alternative structural or non-structural stormwater management practices for their projects, so long as those practices meet the standards specified in the WPO and this SUSMP.

1.1 Background

The County's discharges of stormwater are subject to a municipal Stormwater permit. That permit [National Pollutant Discharge Elimination System **(NPDES)** permit No. CAS0108758, a.k.a. RWQCB Order No. 2001-01], hereinafter referred to as the "Municipal Permit", was issued to San Diego County, the Port of San Diego, and the 18 cities within San Diego County (collectively, the **Copermittees**) by the San Diego Regional Water Quality Control Board (**Regional Board** or **RWQCB**) on February 21, 2001. The Municipal Permit

requires the development and implementation of a program addressing urban runoff pollution issues in development planning for public and private projects.

The requirement to implement a program for development planning is based on federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating urban runoff discharges from municipal, industrial, and construction activities under the NPDES program.

The Municipal Permit requires enactment and enforcement of local ordinances, the development and implementation of a JURMP, and the development and implementation of a SUSMP based on a Copermittee model approved by the Regional Board.

Under the Municipal Permit, the JURMP must be designed to:

1. Ensure that discharges from urban runoff conveyance systems do not cause or contribute to a violation of water quality standards;
2. Effectively prohibit non-storm water discharges in urban runoff; and
3. Reduce the discharge of pollutants from urban runoff conveyance systems to the Maximum Extent Practicable (**MEP**).

The MEP standard takes both the effectiveness and costs of stormwater pollution measures into account. It is, as the name states, based in part on what is "practicable." However, the Municipal Permit also requires that water quality standards be met. In some locations and circumstances this performance standard may require stormwater pollution control or treatment efforts that are more costly than the measures that would be required solely to meet the MEP standard.

Under section F.1.b.2 of the Municipal Permit, the SUSMP has a narrower application than JURMP programs generally. However, SUSMP programs must be based on a different set of performance standards.

The SUSMP is mandated only for significant new development and significant redevelopment projects ("Priority Development Projects" or "Priority Projects" as defined in the Municipal Permit). The County program tracks these definitions exactly.

For Priority Projects, the Municipal Permit mandates that the County require the capture and the treatment or infiltration of a certain volume or flow of stormwater from defined storm events. The devices put in place to achieve this are referred to as Structural Treatment BMPs. Numeric sizing criteria define how much water must be managed in this way.

Because these requirements are numerical and mandatory, it is important that developers and County staff address them early in the projects design process. In many cases early planning will allow SUSMP requirements to be met using natural or enhanced natural BMPs that can be incorporated into the design of projects, instead of relying on expensive add-on BMPs.

The Municipal Permit as implemented by the Regional Board does allow two means to mitigate the potential harshness of SUSMP requirements. First, the County can grant a waiver from SUSMP requirements when all available structural treatment BMPs have been considered and rejected as infeasible. Second, the County can allow a small number of projects to be designed and built using the "LEAD Method" described in Appendix G of this SUSMP.

In addition, the County hopes to implement a Site Design Treatment Credits Program in the near future to mitigate the potential harshness of SUSMP requirements. The Regional Board has authorized such programs on a conditional basis. See Chapter 7 of this SUSMP.

1.2 Summary

A Model Standard Urban Storm Water Mitigation Plan was developed collectively by the Copermittees to address post-construction urban runoff pollution from new development and redevelopment projects that fall under "priority project" categories. The goal of the Model SUSMP was to develop and implement practicable policies to ensure to the maximum extent practicable that development does not increase pollutant loads from a project site and considers urban runoff flow rates and velocities. This goal may be achieved through site-specific controls and/or drainage area-based or shared structural treatment controls. This Model SUSMP, collectively developed by the Copermittees, identified appropriate BMPs for certain designated project types to achieve this goal. This Model SUSMP was reviewed and approved by the Regional Board on June 12, 2002. The Copermittees are required to adopt their own Local SUSMP and ordinances consistent with the Regional Board-approved Model SUSMP within 180 days after that approval.

This SUSMP and the WPO (including the SSM) are consistent with the Model SUSMP and serves as the County's SUSMP. Applicable SUSMP requirements are incorporated into Priority Project plan(s) as part of the development plan approval process for discretionary projects. Similar requirements are incorporated into County CIP construction projects. To allow flexibility in meeting SUSMP design standards, structural treatment control BMPs may be located on- or off-site, used singly or in combination, or shared by multiple developments, provided certain conditions are met.

To facilitate use by the development community, this SUSMP also addresses non-SUSMP development projects, including project that the County now reviews

and approved on a ministerial basis. Applicable requirements for ministerial projects must also be incorporated into plans for those projects prior to the County issuing a permit.

1.3 Priority Projects and SUSMP Requirements

All new development and significant redevelopment projects that fall into one of the Priority Project categories set out in the Municipal Permit are subject to the SUSMP requirements in the WPO and this SUSMP (unless the application of those requirements is precluded under state law based on the prior approval status of the project). In the instance where a project feature, such as a parking lot, falls into a Priority Project category, the entire project footprint is subject to SUSMP requirements.

The lengthy definitions of Priority Project categories are incorporated into the WPO and with one exception[1] control the definition of Priority Project for purposes of the WPO and this SUSMP. Briefly and approximately, these categories are:

a. Residential development of more than 100 units
b. Residential development of 10 to 99 units
c. Commercial developments with a land area for development of greater than 100,000 square feet
d. Automotive repair shops
e. Restaurants, where the land area for development is greater than 5.000 square feet
f. Hillside development, in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 square feet or more of impervious surface
g. Projects within or adjacent to an Environmentally Sensitive Area, or discharging directly to receiving waters within such an area, if development has a defined impact on impervious surface area
h. Parking Lots 5,000 square feet or more or with 15 parking spaces or more and potentially exposed to urban runoff
i. Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater.

Limited Exclusion: Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other

[1] The Municipal Permit also defines Retail Gasoline outlets as Priority Projects. However, this provision has been rejected in an administrative appeal of the permit and is not expected to survive ongoing litigation. Therefore, the WPO does not define these projects as Priority Projects. (This litigation may result in other revisions to the Municipal Permit, the WPO and this SUSMP in the near future.)

structures associated with utility projects are subject to SUSMP requirements if one or more of the criteria above are met.

1.4 Definitions

Accelerated Erosion: means erosion caused by development activities that exceeds the natural processes by which the surface of the land is worn away. Erosion includes the movement or loss of soil by the action of water, wind, or chemical action.

Attached Residential Development: means any development that provides 10 or more residential units that share an interior/exterior wall. This category includes, but is not limited to: dormitories, condominiums and apartments.

Authorized Enforcement Staff: means any County employee supervised by an Authorized Enforcement Official, assigned to duties involving permits and other County approvals, inspections, and enforcement related to the WPO.

Authorized Enforcement Official: means the Director of Public Works; the Director of the Department of Planning and Land Use; the Director of Environmental Health; and the Agricultural Commissioner, Department of Agriculture, Weights and Measures.

Automotive Repair Shop: means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Basin Plan: The plan for the protection of water quality prepared by the Regional Water Quality Control Board in response to the Porter-Cologne Water Quality Control Act. The Basin Plan for the San Diego Region is also known as the Water Quality Control Plan for the San Diego Basin (9) and contains Water Quality Standards for the federal Clean Water Act.

Best Management Practices: means schedules of activities, pollution treatment practices or devices, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices or devices to prevent or reduce the discharge of pollutants directly or indirectly to Stormwater, Receiving Waters, or the Stormwater Conveyance System. Best Management Practices also include but are not limited to treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage. Best Management Practices may include any type of pollution prevention and pollution control measure that can help to achieve compliance with this Ordinance.

BMPs: means Best Management Practices.

Channel: means a natural or improved watercourse with a definite bed and banks that conducts continuously or intermittently flowing water.

Code of Federal Regulations (or CFR): means the document that codifies all rules of the executive departments and agencies of the federal government. It is divided into fifty volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) list all environmental regulations.

Commercial Development: means any development on private land that is not exclusively heavy industrial or residential uses. The category includes, but is not limited to: mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses, hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, car wash facilities, and other light industrial complexes.

Commercial Development greater than 100,000 square feet means any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than 100,000 square feet. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; commercial airfields; and other light industrial facilities.

Commercial Discharger: means a Discharger who operates a Regulated Commercial Facility.

Constructed Wetland: means a vegetated area that has been deliberately modified to provide or enhance habitat, to provide water quality benefits, or to moderate water flow rates or velocities, that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytes.

County: means the County of San Diego.

County Urban Area: means that portion of the unincorporated area of the County that is within the service area boundary of a public water supply company or agency, as indicated on the map at Appendix A, plus any other land in the unincorporated area of the County which will, after proposed development is completed, route stormwater runoff into or through an underground conveyance other than a road-crossing culvert.

Detached Residential Development: means any development that provides 10 or more freestanding residential units. This category includes, but is not limited to:

detached homes, such as single-family homes and detached condominiums.

Detention: means the temporary storage of storm runoff in a manner that controls peak discharge rates and provides some gravity settling of pollutants.

Detention Facility: means a detention basin or alternative structure designed for the purpose of temporary storage of stream flow or surface runoff and gradual release of stored water at controlled rates.

Developer: means a person who seeks or receives permits for or who undertakes land development activities.

Development Project Proponent: means Developer.

Directly Connected Impervious Area (DCIA): means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable vegetated land area (e.g., lawns).

Discharge: when used as a verb, means to allow pollutants to directly or indirectly enter stormwater, or to allow stormwater or non-stormwater to directly or indirectly enter the Stormwater Conveyance System or Receiving Waters, from an activity or operations that one owns or operates. When used as a noun, "Discharge" means the pollutants, stormwater and/or non-stormwater that is discharged.

Discharger: means any person or entity engaged in activities or operations or owning facilities, which will or may result in pollutants entering stormwater, the Stormwater Conveyance System, or Receiving Waters; and the owners of real property on which such activities, operations or facilities are located; provided however that a local government or public authority is not a discharger as to activities conducted by others in public rights of way.

Discharges Directly To: means that stormwater or non-stormwater enters Receiving Waters from a facility or activity, without mixing with any stormwater or non-stormwater from another facility or activity prior to entering such Receiving Waters.

Drainage Easement: means a legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

Environmentally Sensitive Area: means Impaired Water Bodies, areas designated as Areas of Special Biological Significance or with the RARE beneficial use by the SWRCB in the Water Quality Control Plan for the San Diego Basin (1994 and amendments), National Wildlife Refuges, areas designated as preserves for species-protection purposes by the State of

California or a local government, and pre-approved mitigation areas identified in agreements between the County and state or federal natural resources agencies.

Erosion and Sediment Control Plan: means a Stormwater Management Plan that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities.

ESA: means Environmentally Sensitive Area.

Hillside: means lands that have a natural gradient of 25 percent (4 feet of horizontal distance for every 1 foot of vertical distance) or greater and a minimum elevation differential of 50 feet, or a natural gradient of 200 percent (1 foot of horizontal distance for every 2 feet of vertical distance) or greater and a minimum elevation differential of 10 feet.

Hillside development greater than 5,000 square feet: means any development that would create more than 5,000 square feet of impervious surfaces in hillsides with known erosive soil conditions.

Household Hazardous Waste: means a household hazardous material that no longer has a use and is discarded or intended to be discarded. The term includes but is not limited to paint and paint-related materials; yard and garden products; household cleaners; used oil, motor vehicle fluids, batteries and oil filters; and household batteries.

Hydrologic Soil Group: means the classification system for soil erodability set out in "Soil Survey - San Diego Area, California" (December 1973), issued by the U.S. Department of Agriculture Soil Conservation Service and U.S. Forest Service. (In this system soils are categorized into four runoff potential groups. The groups range from "A" soils, which have high permeability and little runoff production, to "D" soils, which have low permeability rates and produce much more runoff.)

Illegal Connection: means a pipe, facility, or other device connected to the Stormwater Conveyance System or Receiving Waters, which has not been reviewed and authorized by the County; or a permitted/authorized pipe, facility, or other device, which conveys Illegal Discharges.

Illegal Discharge: means any discharge into Stormwater, the Stormwater Conveyance System, or Receiving Waters that is prohibited by this Ordinance. This includes but is not limited to discharges of non-stormwater that are not exempt discharges listed in Section 67.806, any discharge from an Illegal Connection, and any discharge that contains additional pollutants due to the absence of a required BMP or the failure of a BMP unless it qualifies as an upset. Discharges that require a County permit or an RWQCB permit that has not been issued or has not been acknowledged by the Discharger to be applicable are

Illegal Discharges. Discharges regulated under an applicable RWQCB or County permit or SWPPP are Illegal Discharges for purposes of this Ordinance unless compliance with all applicable permit and SWPPP conditions is maintained.

Impaired Water Body: means a water body that is listed by the SWRCB as impaired by a particular pollutant or pollutants, pursuant to section 303(d) of the Federal Clean Water Act. "303(d) listed water body" has the same meaning.

Impervious Cover or Impervious Surface: means constructed or modified surfaces that cannot effectively infiltrate rainfall. The term includes but is not limited to building rooftops, pavement, sidewalks, and driveways.

Impervious Surface Area: means the ground area covered or sheltered by an impervious surface, measured in plan view (i.e., as if from directly above). For example, the "impervious surface area" for a pitched roof is equal to the ground area it shelters, rather than the surface area of the roof itself.

Industrial Activity: means manufacturing, processing, or raw materials storage at a commercial, industrial or municipal facility. The term includes, but is not limited to, industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials; manufactured products, waste material, or by-product creation or storage; material handling; refuse storage or disposal; the application or disposal of process wastewaters; storage and maintenance of material handling equipment; treatment, storage or disposal of residuals; outdoor shipping and receiving; activities in manufacturing buildings; storage of raw materials and intermediate and finished products; and areas where significant industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product, or waste product.

Industrial Discharger: means a Discharger who operates a Regulated Industrial Facility.

Industrial Stormwater Permit: means the State General Industrial Stormwater Permit.

Infiltration: means the process of percolating stormwater or non-stormwater into the subsoil.

Infiltration BMPs or Infiltration Facility: means any structural treatment BMP designed primarily to percolate water into the subsurface, such as an infiltration trench or infiltration basin. An infiltration facility may include filtering prior to or during infiltration. BMPs that infiltrate some water but which are designed primarily to retain water or to treat water, such as retention basins, constructed wetlands, or filtering swales are not infiltration facilities.

Infiltration: means the downward entry of water into the surface of the soil.

Jurisdictional Wetland: means an area that is naturally inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation. This includes but is not limited to areas previously designated by the County as wetlands (e.g., in the County's Resource Protection Ordinance). Constructed wetlands are not jurisdictional wetlands.

Land Development Activity: means any activity or proposed activity that requires any of the permits or approvals listed in section 67.804(e) of this Ordinance.

Land Disturbance Activity: means any activity that moves soils or substantially alters the pre-existing vegetated or man-made cover of any land. This includes, but is not limited to, grading, digging, cutting, scraping, stockpiling or excavating of soil: placement of fill materials: paving, pavement removal, exterior construction: substantial removal of vegetation where soils are disturbed including but not limited to removal by clearing or grubbing: or any activity which bares soil or rock or involves streambed alterations or the diversion or piping of any watercourse. Land Disturbance Activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or the original purpose of the facility, nor does it include emergency construction activities (i.e., land disturbances) required to protect public health and safety.

Land Owner: means the holder of legal title to the land, and other persons or entities who exercise control over a land development project pursuant to rights granted in a purchase agreement, joint venture agreement, development agreement, or long-term lease.

Maintenance [of a BMP]: means periodic action taken to maintain the as-designed performance of a BMP, and includes but is not limited to repairs to the BMP as necessary, and replacement of the BMP by an equally effective or more effective BMP at the end of its useful life.

"Maximum Extent Practicable (MEP)" means the technology-based standard established by Congress in the Clean Water Act 402(p)(3)(B)(iii) that municipal dischargers of urban runoff must meet. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional lines of defense).[2]

[2] When BMPs are required to meet this standard, the BMPs must be the most effective set of BMPs that is still practicable. A BMP is effective if it prevents, reduces or removes the pollutants that would otherwise be present in runoff due to human activity. A BMP is practicable if it complies with other regulations as well as stormwater regulations; is compatible with the area's

MEP: means Maximum Extent Practicable.

Motor Vehicle: means any automobile, car, truck, bus, motor home or other self-propelled vehicle used or suited to use for on-road transportation: and any similar vehicle modified for off-road use.

Municipal Facility: means a facility owned or operated by the County of San Diego, by the Port Authority of San Diego, or by an incorporated City within San Diego County, that is used for a governmental purpose. Facilities on municipally owned land that are leased or rented to others to generate municipal revenues are not Municipal Facilities. (The commercial or industrial lessees of such facilities may, however, be subject to this Ordinance as Commercial Dischargers or Industrial Dischargers.)

MS4: means Municipal Separate Storm Sewers System. A Municipal Separate Storm Sewer System is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, natural drainage features or channels, modified natural channels, man-made channels, or storm drains): (i) Owned or operated by a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting of conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Historic and current development makes use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and a receiving water.

New Development: means land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.

NPDES Permit: means a National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency, the SWRCB, or the RWQCB.

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land use, character, facilities, and activities; is technically feasible (considering area soil, geography, water resources, and other resources available); is economically feasible; and provides benefits that are reasonable in relation to costs.

NPDES Permit No. CAS 0108758: means RWQCB Order No. 2001-01, NPDES Permit No. CAS 0108758, "Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District."

Off-Site BMP: means a stormwater management measure located outside the subject property boundary of a facility or outside the boundary described in the permit application for a land development activity.

On-Site BMP: means a stormwater management measure located within the subject property boundary or a facility, or inside the boundary described in the permit application for a land development activity.

Parking Lot: means land area or facility for the temporary parking or storage of motor vehicles used personally, or for business or commerce.

Performance Standard: means a requirement under this Ordinance that specifies a result that must be achieved (e.g., "minimize impervious surface area" or "do not impair receiving water quality") without specifying the means that must be used to achieve that result. (This Ordinance applies performance standards only to certain land development and redevelopment projects that require discretionary County permits; those permits will typically include enforceable project-specific requirements intended to achieve the result required by the performance standard.)

Priority Development Project (or Priority Project): means a development project that falls within any of the following categories:

i. *Home subdivisions of 100 housing units or more*. This category includes single-family homes, multi-family homes, condominiums, and apartments.

ii. *Home subdivisions of 10-99 housing units*. This category includes single-family homes, multi-family homes, condominiums, and apartments.

iii. *Commercial developments greater than 100,000 square feet*. This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than 100,000 square feet. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes;

shopping malls; hotels; office buildings; public warehouses; automotive dealerships; commercial airfields; and other light industrial facilities.

iv. *Automotive repair shops.* This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

v. *Restaurants*. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet.

vi. *All hillside development greater than 5,000 square feet.* This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

vii. *Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition.* Environmentally sensitive areas include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. “Directly adjacent” means situated within 200 feet of the environmentally sensitive area. “Discharging directly to” means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not

commingled with flows from adjacent lands.

viii. *Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff*. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

ix. *Street, roads, highways, and freeways.* This category includes construction of any paved surface which is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Pollutant: means any agent introduced to stormwater or non-stormwater through human activity that may cause or contribute to the degradation of water quality such that public health, the environment, or beneficial uses of waters may be affected. The term does not include trauma scene post-cleanup residues. The term may include but is not limited to dredged spoil, rock, sand, or silt (excluding sediment, silt, or substances in quantities which would enter Stormwater from a natural undeveloped watershed); solid waste, sewage, garbage, or medical waste; wrecked or discarded equipment; radioactive materials; industrial waste; fecal coliform, fecal streptococcus, and enterococcus bacteria and other pathogens that pose a threat to human health; volatile organic carbon, surfactants, oil and grease, petroleum hydrocarbons, total organic carbon, lead, copper, chromium, cadmium, silver, nickel, zinc, cyanides, phenols, and biocides; and any contaminant which can significantly degrade the quality of Receiving Waters by altering pH, total suspended or settleable solids, biochemical oxygen demand, chemical oxygen demand, nutrients, or temperature.

Primary Pollutant of Concern: means any of the following pollutants, if that pollutant may be discharged from a priority development project or significant redevelopment project, and is also a basis for a listing of the receiving water for the project as impaired pursuant to Section 303(d) of the federal Clean Water Act: sediments, nutrients, heavy metals, organic compounds, trash and debris, oxygen demanding substances, oil and grease, bacteria and viruses, and pesticides.

Projects Discharging to Receiving Waters within Environmentally Sensitive Areas: means all development and significant redevelopment that would create 2,500 square feet of impervious surfaces or increase the area of imperviousness of a project site to 10% or more of its naturally occurring condition, and either discharge urban runoff to a receiving water within an environmentally sensitive area (where any portion of the project footprint is located within 200 feet of the environmentally sensitive area), or discharge to a receiving water within an environmentally sensitive area without mixing with flows from adjacent lands (where the project footprint is located more than 200 feet from the

environmentally sensitive area).

Project Footprint: means the limits of all grading and ground disturbance, including landscaping, associated with a project.

Rainy Season: means, from October 1 through April 30.

Receiving Waters: for purposes of locating structural treatment BMPs for priority development projects, "receiving waters" means surface bodies of water, which directly or indirectly receive discharges from urban runoff conveyance systems, including naturally occurring wetlands, streams (perennial, intermittent, and ephemeral (exhibiting bed, bank, and ordinary high water mark)), creeks, rivers, reservoirs, lakes, lagoons, estuaries, harbors, bays and the Pacific Ocean. Constructed wetlands are not considered wetlands under this definition, unless the wetlands were constructed as mitigation for habitat loss. Other constructed BMPs are not considered receiving waters under this definition, unless the BMP was originally constructed in receiving waters. Wetlands constructed as mitigation for habitat loss by be excluded from this definition on a case-by-case basis with approval by the Executive Officer of the RWQCB. For all other purposes "receiving waters" has the meaning set out in the WPO.

Redevelopment: means any construction, alteration or improvement at an already developed site that will increase the total impervious surface area of that site, or that involves activities that could expose contaminants to rainfall. Redevelopment can include but is not limited to the expansion of building footprints, the addition or replacement of a structure, exterior construction and remodeling, replacement of existing impervious surfaces that is not part of a routine maintenance activity, and other activities that create additional impervious surface.

Regulated Commercial Facility: means all non-residential facilities engaged in business or commerce, whether for profit or not-for-profit, or publicly or privately owned, except for Regulated Industrial Facilities and Municipal Facilities; plus residences used for commercial repair, maintenance, cleaning, manufacturing, food preparation or painting activity if that activity has the potential to result in the discharge of non-stormwater or the discharge of pollutants to stormwater.

Regulated Industrial Facility: means any facility subject to the State General Industrial Stormwater Permit; any other facility primarily engaged in manufacturing, processing, storage or handling of raw materials, processed bulk materials, or refuse; and any other facility with a total outdoor uncovered area of more than two (2) acres that is used for an Industrial Activity. Municipal Facilities are not Regulated Industrial Facilities, unless they are subject to the State General Industrial Stormwater Permit.

Residential Development: means any development on private land that provides

living accommodations for one or more persons. This category includes, but is not limited to: single-family homes, multi-family homes, condominiums, and apartments.

Residential Discharger: means, for an occupied residence, the occupants; and for a vacant residence, the owner and the manager of the residence.

Restaurant: means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Regional Board or RWQCB: means the California Regional Water Quality Control Board for the San Diego Region.

Secondary Pollutant of Concern: means any of the following pollutants, discharged from a priority development project or significant redevelopment project, that is not a primary pollutant of concern for that project: sediments, nutrients, heavy metals, organic compounds, trash and debris, oxygen demanding substances, oil and grease, bacteria and viruses, and pesticides.

Significant Redevelopment: means (1) any Redevelopment in the County Urban Area that creates or adds at least 2,500 net square feet of additional impervious surface area within 200 feet of an Environmentally Sensitive Area (ESA), where runoff from the Redevelopment would Discharge Directly To receiving waters within the ESA; and (2) any Redevelopment in the County Urban Area that creates or adds at least 5,000 net square feet of additional impervious surface area, if that Redevelopment involves grading any natural slope with a total pre-construction height of 20 feet or more and an average pre-construction slope from toe to top of 25% or more in an area of known erosive soil conditions; and (3) any Redevelopment in the County Urban Area in a Priority Development Project Category that creates or adds at least 5,000 net square feet of additional impervious surface area. Significant redevelopment includes, but is not limited to: the expansion of a building footprint; addition to or replacement of a structure; replacement of an impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Significant redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and replacement of damaged pavement.

Site Design BMP: means any project design feature that reduces the creation or severity of potential pollutant sources or reduces the alteration of the project site's natural flow regime. Redevelopment projects that are undertaken to remove pollutant sources (such as existing surface parking lots and other

impervious surfaces) or to reduce the need for new roads and other impervious surfaces (as compared to conventional or low-density new development) by incorporating higher densities and/or mixed land uses into the project design, are also considered site design BMPs.

Source Control BMP (both structural and non-structural): means land use or site planning practices, or structures that aim to prevent urban runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff. Examples include roof structures over trash or material storage areas, and berms around fuel dispensing areas.

State General Construction Stormwater Permit: means NPDES Permit No. CAS000002, Waste Discharge Requirements for Discharges of Stormwater Associated with Construction Activities, and any amendments thereto.

State General Industrial Stormwater Permit: means NPDES Permit No. CAS000001, Waste Discharge Requirements for Discharges of Stormwater Associated with Industrial Activities Excluding Construction Activities, and any amendments thereto.

State Impaired Water Bodies:

Stop Work Order: means an order issued which requires that specifically identified activity or all activity on a site be stopped.

Stormwater: means surface runoff and drainage associated with storm events.

Stormwater Conveyance System: means private and public drainage facilities other than sanitary sewers within the unincorporated area of San Diego County by which urban run-off may be conveyed to Receiving Waters, and includes but is not limited to roads, streets, constructed channels, aqueducts, storm drains, pipes, street gutters, inlets to storm drains or pipes, or catch basins.

Stormwater Management: means the use of structural or non-structural BMPs that are designed to reduce urban run-off pollutant loads, discharge volumes, and/or peak discharge flow rates or velocities. When applied to the County or another municipality, stormwater management also includes planning and programmatic measures.

Stormwater Management Plan: means a plan, submitted on a County form or in a County-specific format in connection with an application for a County permit or other County approval, identifying the measures that will be used for stormwater and non-stormwater management during the permitted activity.

Stormwater Pollution Prevention Plan: means a document (other than a Stormwater Management Plan), which meets the requirements for a SWPPP set out in the State General Construction Stormwater Permit or State General Industrial Stormwater Permit.

Stormwater Retrofit: means a stormwater management BMP designed for an existing development site or activity that previously had either no stormwater management BMPs in place or that relied on BMPs inadequate to meet the stormwater management requirements of the site or activity.

Streets, Roads, Highways, and Freeways Projects: means any project that is not part of a routine maintenance activity, and would create a new paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles and other vehicles. For the purposes of SUSMP requirements, Streets, Roads, Highways and Freeways do not include trenching and resurfacing associated with utility work; applying asphalt overlay to existing pavement; new sidewalk, pedestrian ramps, or bike lane construction on existing roads; and replacement of damaged pavement.

Structural BMP: means a BMP that relies on either a physical condition (other than an entirely natural and undisturbed condition), or on a constructed or installed device to reduce or prevent pollutants in stormwater discharges and authorized non-stormwater discharges. Constructed or enhanced BMPs that depend on natural materials and processes (e.g., constructed drainage swales or buffers, or constructed wetlands), and that require periodic maintenance to function as designed, are Structural BMPs.

Structural Post-Construction BMP: means a structural BMP (other than a temporary construction-related BMP) put in place in connection with a land development or redevelopment project to prevent or reduce contamination in stormwater or Receiving Waters, or to prevent or reduce erosion downstream from the project.

Structural Treatment BMPs: means a structural post construction BMP that treats or filters stormwater to remove pollutants, or that infiltrates stormwater to soils.

SUSMP: means Standard Urban Stormwater Mitigation Plan.

SWPPP: means Stormwater Pollution Prevention Plan.

SWRCB: means the State Water Resources Control Board.

Trauma Scene Post-Clean Up Residues: means residues that remain at a trauma scene after trauma scene wastes are removed pursuant to the Trauma Scene Waste Management Act, and after any spilled materials and fluids from

vehicles are cleaned up. Bleach and similar chemicals used to clean a trauma scene are not trauma scene post-clean up residues.

Treatment Control (Structural) BMP: means any engineered system designed and constructed to remove pollutants from urban runoff. Pollutant removal is achieved by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Tributary To an Impaired Water Body: a facility or activity is tributary to an impaired water body if urban runoff from that facility or activity enters (1) the stormwater conveyance system at a place and in a manner that will carry pollutants for which that water body is impaired in that discharge to the impaired water; (2) a flowing stream that will carry pollutants for which that water body is impaired in that discharge to the impaired water; or (3) an ephemeral stream that reaches the impaired water during storm events and that will carry pollutants for which that water body is impaired from the facility or activity to the impaired water body during such storm events.

Upset: means an exceptional incident in which there is unintentional and temporary noncompliance with technology based effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Urban Run-off: means all flows in a stormwater conveyance system in the County Urban Area other than point source discharges in violation of a site-specific NPDES permit. Urban run-off includes but is not limited to stormwater, exempt non-stormwater discharges, and illicit discharges.

Water Main: means a potable or recycled water delivery line greater than or equal to four (4) inches in diameter.

Watercourse: means a permanent or intermittent stream or other body of water, either natural or improved, which gathers or carries surface water.

Water Quality Standards: are defined as the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.) of water and the water quality objectives adopted by the State or the United States Environmental Protection Agency to protect those uses.

Waters of the United States: means water subject to the regulatory jurisdiction of the United States under the Federal Clean Water Act and applicable case law. (In general, this includes “navigable” waters, waters tributary to “navigable” waters, and adjacent wetlands.)

Wetland: for purposes of the application of the definition of "receiving waters" to determine the location of structural treatment BMPs for priority development projects, "wetland" means those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support vegetation typically adapted for life in saturated soil conditions. Generally includes playa lakes, swamps, marshes, bogs mudflats, natural ponds and similar areas. Constructed wetlands are not considered wetlands under this definition, unless the wetlands were constructed as mitigation for habitat loss. Wetlands constructed as mitigation for habitat loss by be excluded from this definition on a case-by-case basis with approval by the Executive Officer of the RWQCB. For all other purposes "receiving waters" has the meaning set out in the WPO.

1.5 Ordinances Pertaining to Water Quality

To provide adequate authority to implement the requirements of the revised Municipal Permit, the County of San Diego Board of Supervisors adopted the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance on January 16, 2002. The following objectives are stated in WPO section 67.802:

- Prohibiting polluted non-stormwater discharges to the Stormwater Conveyance System;
- Establishing minimum requirements for stormwater management, to prevent and reduce pollution;
- Establishing requirements for the management of stormwater flows from development projects, both to prevent erosion and to enhance existing water-dependent habitats;
- Establishing standards for the use of off-site facilities for stormwater management to supplement on-site facilities and practices at new development sites; and
- Establishing notice procedures and standards for adjusting stormwater management requirements where necessary.

The County also adopted the Stormwater Standards Manual that is Appendix A to the WPO. It is not a stand-alone document; that is, the two must be read in conjunction with each other. The purpose of the SSM is to establish clear minimum stormwater management requirements and controls, and to support the objectives of the WPO. In general, it sets out in more detail what dischargers must do to comply with the WPO.

1.6 Importance of Stormwater Management

Urban development has a profound influence on the quality of San Diego's waters. Development alters the local hydrologic cycle (Fig. 1.1). The hydrology of a site changes during clearing and grubbing as well as the grading phase that

occur during construction. Trees, shrubs, grasses and agricultural crops that had intercepted and absorbed rainfall are removed and natural depressions that had temporarily ponded water are graded to a uniform slope.

The situation becomes compounded after construction. Roads, roof tops, parking lots, driveways, and other impervious surfaces greatly reduces the amount of runoff that normally infiltrates into the ground. Most of the rainfall is converted to stormwater runoff.

The increase in stormwater runoff can overwhelm existing drainage systems. To accommodate the increase flow, the natural drainage system is often improved to efficiently collect runoff and rapidly transport it away (using curb and gutter, culverts and lined channels). The stormwater runoff is ultimately discharged to downstream waters such as rivers, lagoons, bays, or the ocean.

Also, the Municipal Permit states that urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash which can either be washed or directly dumped into the MS4.

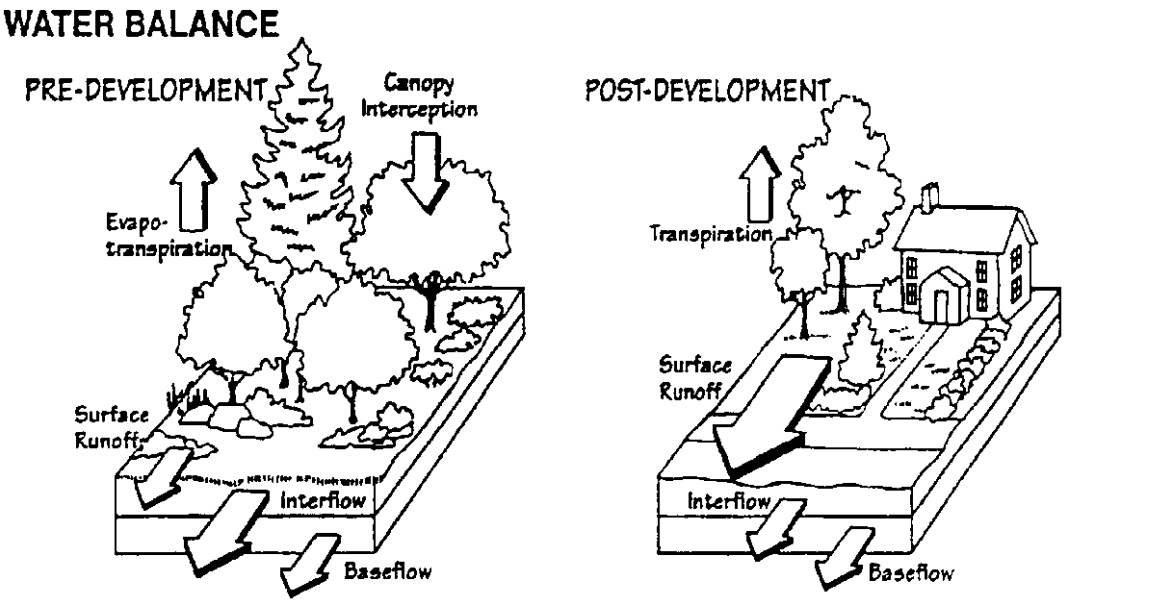

Figure1.1 Water Balance at Developed and Underdeveloped Site
(Source: Schueler, 1987)

1.7 Revising the SUSMP

This SUSMP establishes minimum performance criteria that shall be met by all techniques and devices used for stormwater management in the County. On occasion, variations or other techniques and devices used may be found to function better or be more desirable for stormwater management by plan approval departments. The County is responsible for approving the use of new techniques for controlling runoff from new development. If a project proponent or County staff decides they would like to utilize a revised technique or new device, they need to prepare a Standard and accompanying Specifications with a cover letter to be submitted to the County.

The DPW Stormwater Program Manager will review the revised technique or device and any supporting data submitted, and will determine whether the proposal meets the requirements of the WPO and would be at least as protective of the environmental as a technique or device that could be selected based on this SUSMP. When the technique or device is approved by the County, an approval authorization from the Director of DPW will be issued. Once the revised or new technique or device has received approval it can be used on a regular basis. A great amount of deviation from the methods within this manual is not anticipated, but where improved stormwater management can be achieved, revisions will generally be looked upon favorably.

2.0 Private Development and Public Improvement Procedures

Private development and public improvement projects conducted within the County Urban Area must address stormwater quality during the project planning, design, construction, and post-construction phases. The procedures for addressing stormwater quality are outlined in this SUSMP.

2.1 Private Development Projects

Projects submitted to the County for review and approval may be subject to the requirements of the Municipal Permit. Development and redevelopment projects submitted for review and approval will be screened to determine the level of stormwater quality management required. Each proposed project is required to implement measures to ensure that:

(1) Pollutant discharges and runoff flows from development are reduced to the maximum extent practicable; and
(2) Receiving water quality objectives are not violated throughout the life of the project.

The process to address stormwater quality involves the development of a SWMP at the earliest stage of the project application process, which includes details of post-construction BMPs early in the design process, construction BMPs, and the implementation of a long-term post-construction maintenance program. A key element of the process is the selection of BMPs as shown in Figure 2.1.

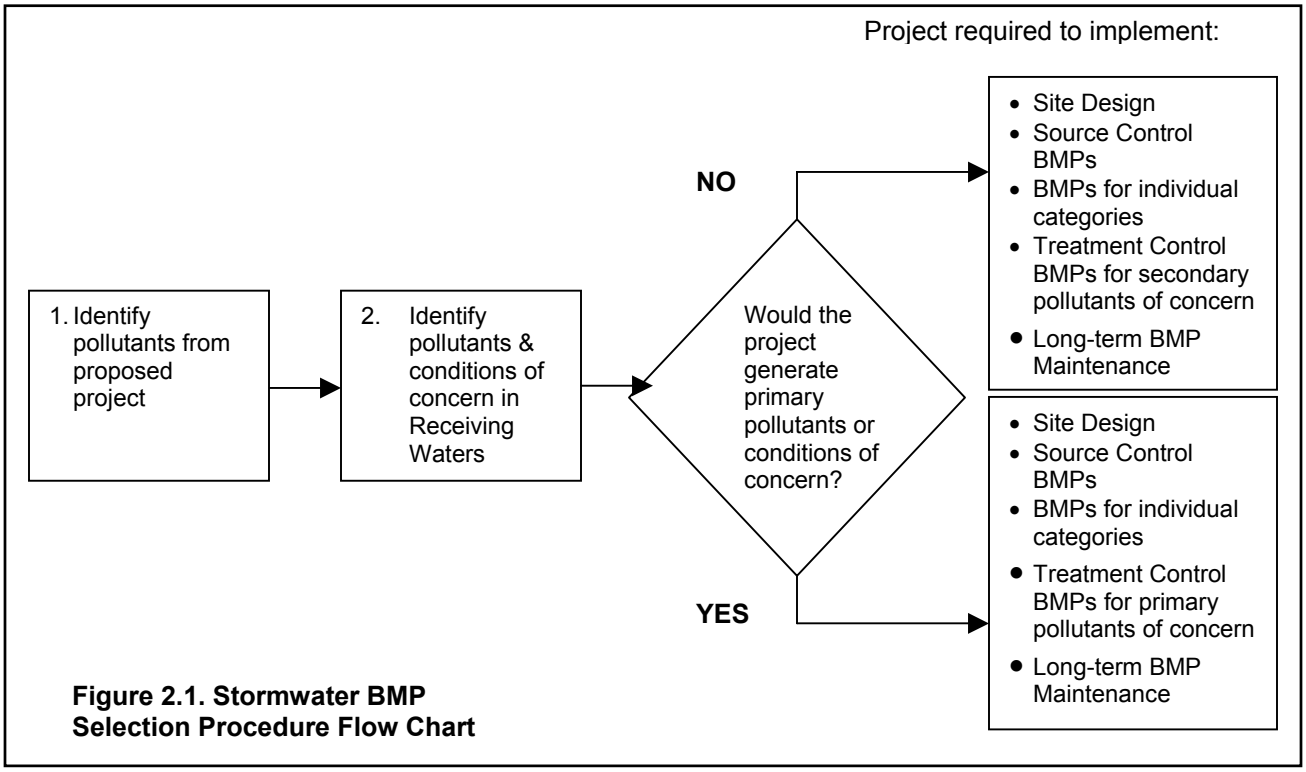

Figure 2.1. Stormwater BMP Selection Procedure Flow Chart

2.1.1 Types of Permits

The County issues either a discretionary or ministerial permits. Both types of permits are required to address water quality. For priority projects, County will approve the SWMP project plan(s) as part of the development plan approval process for discretionary permits and prior to issuing permits for ministerial projects.

The following discretionary permits shall address stormwater management:

a. Administrative Permit for Clearing
b. Agricultural Exemption
c. Lot Line Adjustment
d. Final Map Modification
e. Grading Plan (including Modification or Renewal)
f. Improvement Plan (including Modification)
g. Landscape Plan
h. Major Use Permit (including Modification, Minor Deviation, or Extension)
i. Minor Use Permit (including Modification, Minor Deviation, or Extension)
j. Parcel Map Modification
k. Reclamation Plan
l. Site Plan (including Amendment)
m. Solid Waste Facility Permit
n. Tentative Map (including Resolution Amendment or Time Extension)
o. Tentative Parcel Map
p. Variance
q. Watercourse Permit

The following ministerial permits shall address stormwater management:

a. Building Permit
b. Construction Right of Way Permit
c. Encroachment Permit
d. Excavation Permit
e. On-site Wastewater System Permit
f. Underground Tank Permit
g. Well Permit

Additional design requirements for ministerial land development permits are provided in Part G.8 of the WPO. This has been included as Appendix B.

2.1.2 Submission of SWMP

Development and submittal of a SWMP is part of the Project Application and is prepared by the project proponent. This plan serves as the basis for a long-term solution to water quality improvements. Early consideration and planning of permanent BMPs ensures that water quality will be addressed for many years to

come. Also, treatment BMPs are often difficult to add to the completed design of a development project without causing substantial changes to the project's character or viability. The earlier in the design process stormwater facilities are considered, the greater the chance a successful and efficient design can be accomplished.

The SWMP provides the needed information to address both stormwater and non-stormwater issues. The purpose of the SWMP is as follows:

- To provide all the information needed to fully and adequately characterize the existing water quality;
- Analyze the drainage, develop effective post-construction stormwater protection, and;
- Ensure the effectiveness of the BMPs through proper maintenance and long-term fiscal responsibility.

Information from the SWMP shall be used in formulating staff's CEQA responses and proposed conditions for the project. The SWMP serves as the proponents plan for compliance with the County's SUSMP requirements. The SWMP is a living document and could require changes if one of the following conditions apply:

- The project evolves to a Priority Project;
- The plans submitted for a Grading Permit are substantially different than those submitted as part of initial application, or;
- A Stormwater Impact Analysis is needed.

For priority projects, the SWMP requires additional information including a more detailed description of the project. Data from the project drainage report are utilized to determine the size of treatment BMPs and assess the need for temporary storage to capture increased runoff. Pollutants and conditions of concern derived from SSM and the San Diego Basin Plan are described in the SWMP. In addition, the SWMP requires projects to establish BMPs based on three categories: site design, source control and treatment control. An example of a SWMP for priority projects is included as Appendix C.

2.1.2.1 SWMP Process

The SWMP is formatted to follow this manual. The County requires a SWMP at time of initial application contains the minimum project elements as identified below. The SWMP shall be prepared by the project proponents and comply with both the WPO and SSM.

- Project location, description and physical features;
- Surrounding land use and proposed project land use;
- Watershed contribution and potential impacts to State Impaired Waterbodies "303(d) list";

- Beneficial Uses of Surface Waters and Ground Water surrounding the project;
- Characterization of project runoff both pre-project and post-project, conditions of concern, locations of stormwater outfall(s), tributary drainage area to outfall(s), and site hydrology;
- Water quality pollutants of concern, treatment volume based on water quality design storm, site plans and adjacent land use, and soil characteristics;
- Mitigation measures to protect water quality, pollution prevention BMPs (MEP based), site design BMPs, source control BMPs, natural BMPs, and structural treatment BMPs;
- Mitigation measures to prevent increases in downstream erosion to MEP: site design BMPs, source control BMPs, natural BMPs, and structural treatment BMPs;
- Any infiltration BMPs proposed for use on project;
- A maintenance plan addressing post-construction BMPs. The BMP maintenance process is described in Chapter 6. The intent of BMP maintenance is to ensure the long-term performance of the BMPs, and;
- Documentation such as agreements or easements pertaining to proposed BMP maintenance.

The SWMP shall be prepared with the sections set forth in the example in Appendix C. Since the SWMP is a living document, the initial submission, provided during project initiations, need not include BMPs engineered in accordance to the drainage report nor a comprehensive maintenance plan. The BMPs should be conceptually sized and located. An addendum will be provided as part of the Grading Permit application. The SWMP addendum, as part of the Grading Permit application, will include the properly engineered BMP and a refined maintenance plan. All treatment BMPs shall be incorporated in the design plans.

2.1.3 Review and Approval Process

County staff in the departments of Public Works and Planning & Land Use shall review the SWMP as part of the overall project application. The process for SWMP review is outlined in Figure 2.2. As previously noted, information from the SWMP shall be used in formulating CEQA responses and findings, findings of project code compliance, and in proposing conditions for the project.

Upon submittal of the project application staff will initiate a review. Staff will complete a draft Initial Study/Environmental Analysis Form (IS/EA Form), which addresses water quality issues. The issues addressed in the IS/EA Form have been updated in response to the requirements of section F.1.c of the Municipal Permit.

During project review, and as part of the CEQA process, staff evaluates all discretionary applications for potential impacts to environmental resources, including stormwater. If a proposed project has been reviewed previously under CEQA, and a certified/approved environmental document exists for the project, staff reviews this documentation to determine if adequate information is included to address the requirements under the WPO. If no such information exists in the previous documentation, or the information does not adequately address the requirements under the WPO, and it is deemed necessary by staff on the basis of the type or scale of project, a Stormwater Impact Analysis Report is required for the project following the procedures outlined below.

Even if a project is exempt from the CEQA process, it still must be found in compliance with the WPO and go through the review process.

For those projects without any previous environmental documentation, or if insufficient documentation exists, staff review the project for stormwater issues in the following manner:

2.1.3.1 Prioritization

The project is reviewed using the County's desktop-based GIS application, existing regional land use maps, and other related resources including the prioritization criteria from Municipal Permit section (F.1.b. (2)(a)), to determine the project's prioritization, and potential stormwater impacts from post-construction activities. The prioritization of projects will be used when determining which projects must meet SUSMP requirements. As part of this process, staff from the DPLU and DPW review the SWMP, Preliminary Grading Plan or other hydrologic information submitted with the Project's application package, and determine what issues must be addressed.

2.1.3.2 Conditions of Project Approval

Recommendations from the SWMP regarding structural BMPs and the long-term maintenance for the project is used in formulating conditions of project approval. The conditions will typically specify that the requirements of the SWMP shall be implemented. The conditions will be structured to assure that grading or other actions that could threaten water quality or contribute to contaminated stormwater run-off will not be allowed until all required BMPs and other actions are implemented to the satisfaction of the County.

In addition, if the proposed structural BMPs require long-term maintenance, the applicant will be required to take all necessary measures, to the satisfaction of the County that such ongoing maintenance will occur to prevent water quality pollution. The SSM identifies several methods of meeting this requirement, which may be accepted by the County.

2.1.4 Non-Priority Projects

Projects that do not meet the priority project criteria are considered non-priority projects. As such, these projects need only to complete a Minor SWMP unless, the County requires a SWMP for the project. In addition, the following types of projects/permits shall address water quality via a Minor SWMP:

- Construction Right of Way Permits;
- Encroachment Permits;
- Minor Excavation Permits;
- Variances;
- Boundary Adjustments;
- Minor Use Permits for Cellular Facilities, and;
- Residential Tentative Parcel Maps.

These types of projects/permits are generally not significant contributors to pollution loading after construction is complete. The SWMP for Minor Projects is attached as Appendix D.

For projects requiring only ministerial permits, SWMP requirements shall be incorporated into the project design and shown on the plans prior to the issuance of any ministerial permits.

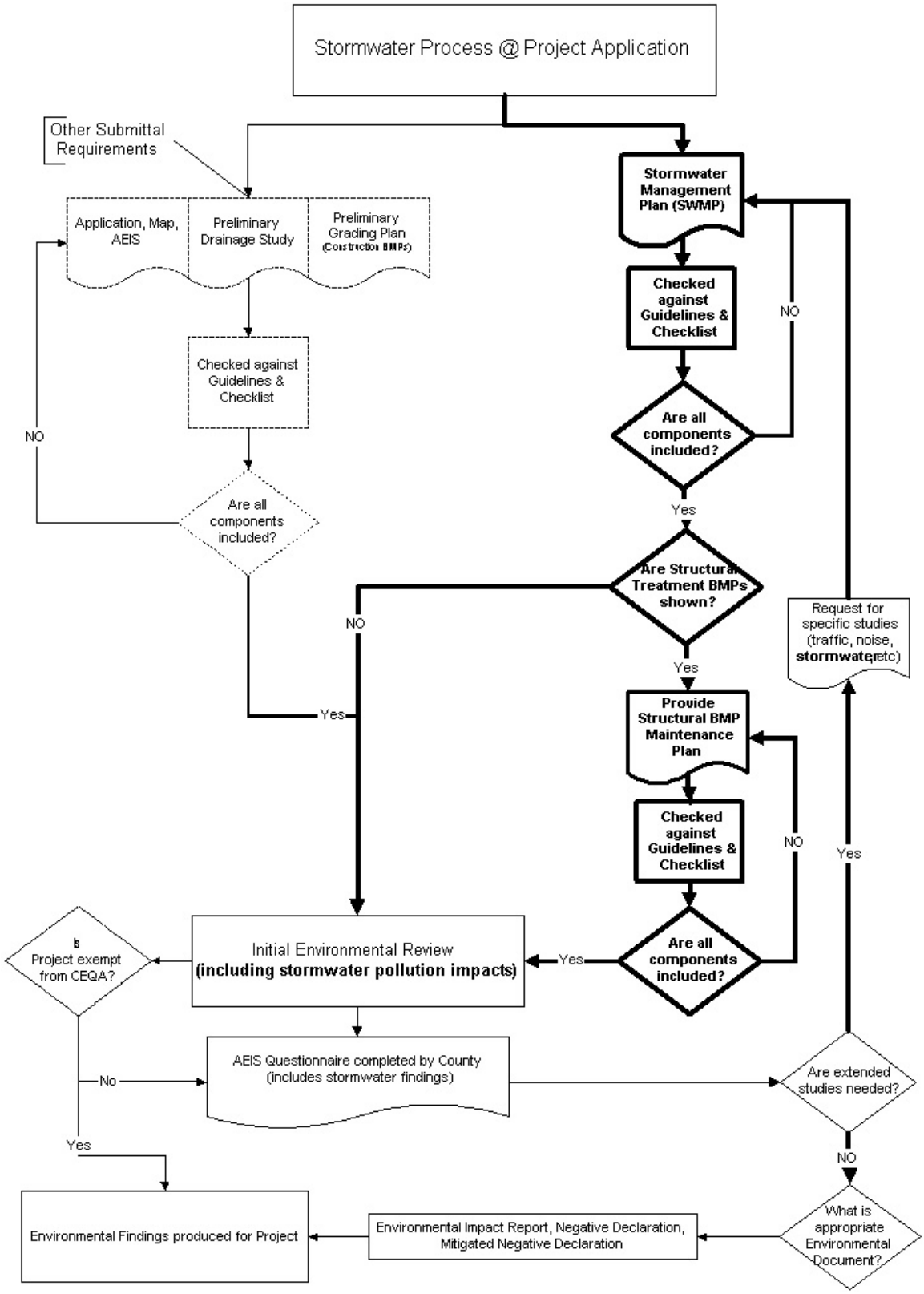

Figure 2.2 Discretionary Application Process

2.2 Capital Improvement Projects

The process of addressing stormwater quality for capital improvement projects (CIP) is essentially the same as land development projects. SUSMP requirements are incorporated into the project design and shown on the plans prior to bidding for construction contracts, or equivalent.

2.3 Construction Phase BMPs

This manual does not explicitly provide guidance for construction phase BMPs. All projects are required to address construction BMPs in accordance with ordinances, rule or regulation, statute, or other provisions of law. There is a requirement in the SWMP to provide a basic description of the BMPs proposed during construction. Projects that qualify, under the definition of the Statewide General Construction Permit, are required to submit a Storm Water Pollution Prevention Plan as part of the Grading Permit process. Inspection procedures have been established to ensure compliance during the construction phase.

3.0 Stormwater Quality Considerations During Project Planning

3.1 Identify Pollutants and Conditions of Concern

The process for having an effective stormwater management plan begins at the project initiations stage. The primary stormwater quality objectives during project planning are to:

(1) Identify potential stormwater quality impacts and develop/evaluate options to avoid, reduce or minimize the potential for stormwater quality impacts where practical;
(2) Ensure that the project includes sufficient space and budget for required stormwater controls;
(3) Identify project-specific permanent and temporary BMPs that may be required to mitigate impacts.

For priority projects the proponents shall use the guidance in this chapter to identify pollutants and conditions of concern, for which they need to mitigate or protect against. Once identified, appropriate control measures for these pollutants and conditions are specified in Chapter 4, "Guidance for Selection of Permanent BMPs". Site design and source control BMPs are required based on pollutants commonly associated with the proposed type (see Table 4.2, "Standard Storm Water BMP Selection Matrix"). Treatment Control BMPs are also required for the project's anticipated pollutants of concern (see Table 4.3, "Enhanced Treatment Control BMP Selection Matrix,").

Sections 3.1.1 through 3.1.3 provides the procedure for identifying pollutants and conditions of concern. For private priority projects, this information is to be provided as part of the project SWMP submitted as part of the project application. Without it, the project will be deemed incomplete. For projects that qualify for a Minor SWMP, the process is simplified by selecting the appropriate existing condition (Appendix D). For public CIP priority projects, the information is incorporated into the project's Water Quality Report.

General Categories of Water Pollution

Urban runoff from a developed site has the potential to contribute pollutants, including oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system and receiving waters. For the purposes of identifying pollutants of concern and associated storm water BMPs, pollutants are grouped in nine general categories as follows:

1. Sediments – Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

2. Nutrients – Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
3. Metals – Metals are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary source of metal pollution in storm water are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.
4. Organic Compounds – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
5. Trash & Debris – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.
6. Oxygen-Demanding Substances – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of

dissolved oxygen in a water body and possibly the development of septic conditions.

7. Oil and Grease – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.
8. Bacteria and Viruses – Bacteria and viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
9. Pesticides – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

3.1.1 Identify Pollutants from the Project Area

Using Table 3.1, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

Table 3.1. Anticipated and Potential Pollutants Generated by Land Use Type

	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >100,000 ft^2	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft^2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

3.1.2 Identify Pollutants of Concern

Pollutants generated by the proposed priority project that exhibits one or more of the following characteristics are considered pollutants of concern:

- Current loadings or historical deposits of the pollutant are impairing the beneficial uses of a receiving water;
- Elevated levels of the pollutant are found in water or sediments of a receiving water and/or have the potential to be toxic to or bioaccumulate in organisms therein; and
- Inputs of the pollutant are at a level high enough to be considered potentially toxic.

To identify primary pollutants of concern in receiving waters, each priority project shall, at a minimum, do the following:

1. For each of the proposed projects discharge points, identify the receiving water(s) that each discharge point proposes to discharge to, including hydrologic unit basin number(s), as identified in the most recent version of the *Water Quality Control Plan for the San Diego Basin*[3], prepared by the San Diego Regional Water Quality Control Board.
2. Identify any receiving waters, into which the developed area would discharge to, listed on the most recent list of Clean Water Act Section 303(d) impaired water bodies[4]. List any and all pollutants for which the receiving waters are impaired.
3. Compare the list of pollutants for which the receiving waters are impaired with the pollutants anticipated to be generated by the project as identified in Table 3.1. Any pollutants identified by Table 3.1, which are also causing impairment of receiving waters, shall be considered primary pollutants of concern.

For projects where no primary pollutants of concern exist, those pollutants identified through the use of Table 3.1 shall be considered secondary pollutants of concern.

3.1.3 Identify Conditions of Concern

Common impacts to the hydrologic regime resulting from development typically include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. These changes have the potential to permanently impact downstream channels and habitat integrity. A change to a priority project site's hydrologic regime would be considered a condition of concern if the change would impact downstream channels and habitat integrity.

Because of these potential impacts, the following steps shall be followed by each priority project:

1. Evaluate the project's conditions of concern in a drainage study report prepared by a registered civil engineer in the State of California, with experience in fluvial geomorphology and water resources management. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.
2. As part of the drainage study, the civil engineer shall conduct a field

[3]. http://www.swrcb.ca.gov/~rwqcb9/Programs/Planning_and_Services/SD_Basin/sd_basin.html
[4]. http://www.swrcb.ca.gov/tmdl/303d_lists.html, San Diego is in Region 9

reconnaissance to observe and report on downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies) and the area's susceptibility to erosion or habitat alteration as a result of an altered flow regime.

3. The drainage study shall compute rainfall runoff characteristics from the project area including, at a minimum, peak flow rate, flow velocity, runoff volume, time of concentration, and retention volume. These characteristics shall be developed for the two-year and 10-year frequency, Type I storm, of six-hour or 24-hour duration (whichever is the closer approximation of the site's time of concentration), during critical hydrologic conditions for soil and vegetative cover[5]. The drainage study shall report the project's conditions of concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish that pre-project hydrologic conditions affecting downstream conditions of concern would be maintained by the proposed project, satisfactory to the County, by incorporating the site design, source control, and treatment control requirements identified in Chapter 4.

3.1.4 Avoiding Potential Impacts

The project planning phase provides the best opportunity to avoid adverse water quality impacts as alignments and space requirements are developed and refined. Avoiding impacts may reduce or eliminate the need for permanent treatment controls and other mitigation-type BMPs. When refined geometric alignment maps are submitted for County review, the alignment should include sufficient reserved land to construct and maintain all required BMPs at appropriate locations. Tables that provide assistance in assessing potential impacts are included in Appendix E.

3.2 Capital Improvement Projects

The process for identifying pollutants and conditions of concerns for priority public capital improvement projects is the same as those for private land development projects. Priority public capital improvement projects must follow the same process as described above.

[5]. Design storms can be found at http://www.wrcc.dri.edu/pcpnfreq.html. The project proponent or County staff may calculate the storm events using local rain data. In addition, isopluvial maps contained in the County of San Diego Hydrology Manual may be used to extrapolate rainfall data to areas where insufficient data exists. If isopluvial maps are selected, the project proponent or County staff shall describe their method for using isopluvial maps in their Jurisdictional SUSMP.

4.0 Guidance for Selection of Permanent BMPs

This chapter presents guidance for BMPs to be implemented after pollutants of concerns have been determined. Throughout this chapter, all priority projects shall consider, and incorporate, and implement where expressly required by the Municipal Permit and if not so required where determined applicable and feasible by the County, stormwater BMPs into the project design, in the following progression:

- Site Design BMPs
- Source Control BMPs
- Treatment Control BMPs

Site design BMPs reduce the need for source and/or treatment control BMPs, and source control BMPs may reduce the amount of treatment control BMPs needed.

At a minimum, priority projects must implement source control BMPs, and must implement treatment control BMPs unless a waiver is granted based on the infeasibility of all treatment control BMPs. BMPs must also achieve certain performance standards set out in the Municipal Permit section F.2. (b) (i to xiv). Selection of BMPs from the menus included in this SUSMP, using the rules set out in this guidance document, must fulfill these requirements.

In addition, runoff treated by site design or source control BMPs, such as rooftop runoff treated in landscaping, may be useful in reducing the quantity of runoff required to be treated in Section 4.3, “Treatment Control BMPs.”

To select a structural treatment BMP using the Treatment Control BMP Selection Matrix, each priority project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 3.1). Any pollutants identified by Table 3.1, which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, shall be considered primary pollutants of concern. Priority projects that are anticipated to generate a primary pollutant of concern shall meet all applicable requirements in this chapter and shall select a single or combination of stormwater BMPs from Table 4.3, which maximizes pollutant removal for the particular primary pollutant(s) of concern.

Priority projects that are **not** anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired shall meet applicable standard requirements in this chapter, and shall select a single or combination of stormwater BMPs from Table 4.3, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the “maximum extent practicable” standard.

Where a site generates both primary and secondary pollutants of concern, primary pollutants of concern receive priority for BMP selection. For such sites, selected BMPs must only maximize pollutant removal for the primary pollutants of concern. Where a site generates only secondary pollutants of concern, selected BMPs shall target the secondary pollutant of concern determined to be most significant for the project. Selected BMPs must be effective for the widest range of pollutants of concern anticipated to be generated by a priority project (as identified in Table 3.1) consistent with the maximum extent practicable standard.

There are 10 Principles sequentially placed throughout this chapter. These principles provide the minimal guidance for determining the minimum permanent BMPs required for the project. The project SWMP should reflect that these factors were addressed.

Alternative stormwater BMPs not identified in Table 4.3 may be approved at the discretion of the County, provided the alternative BMP is as effective in the removal of concerns as other feasible BMPs listed in Table 4.3. The process for submitting an alternative stormwater BMP is outlined in section 6 of this SUSMP.

Table 4.2 Standard Storm Water BMP Selection Matrix

Priority Project Category	*Site Design BMPs[1]*	*Source Control BMPs[2]*	*Requirements Applicable to Individual Priority Project Categories[3]*										
			a. Private Roads	b. Residential Driveways & Guest Parking	c. Dock Areas	d. Maintenance Bays	e. Vehicle Wash Areas	f. Outdoor Processing Areas	g. Equipment Wash Areas	h. Parking Areas	i. Roadways	j. Fueling Areas	k. Hillside Landscaping
Detached Residential Development	R	R	R	R									R
Attached Residential Development	R	R	R	R									R
Commercial Development >100,000 ft^2	R	R			R	R	R	R					
Automotive Repair Shop	R	R			R	R	R		R			R	
Restaurants	R	R			R				R				
Hillside Development >5,000 ft^2	R	R	R										R
Parking Lots	R	R								R[4]			
Streets, Highways & Freeways	R	R									R		

R = Required; select one or more applicable and appropriate BMPs from the applicable steps in Section 4.1 & 4.2, or equivalent as identified in sections 4.6.1-4.6.3.
(1) Refer to Section 4.1.
(2) Refer to Section 4.2.
(3) Priority project categories must apply specific storm water BMP requirements, where applicable. Projects are subject to the requirements of all priority project categories that apply.
(4) Applies if the paved area totals >5,000 square feet or with >15 parking spaces and is potentially exposed to urban runoff.

Table 4.3 Treatment Control BMP Selection Matrix[1].

Pollutant of Concern	*Treatment Control BMP Categories*						
	Biofilters	Detention Basins	Infiltration Basins[2]	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Hydrodynamic Separator Systems[3]
Sediment	M	H	H	H	L	H	M
Nutrients	L	M	M	M	L	M	L
Heavy Metals	M	M	M	H	L	H	L
Organic Compounds	U	U	U	M	L	M	L
Trash & Debris	L	H	U	H	M	H	M
Oxygen Demanding Substances	L	M	M	M	L	M	L
Bacteria	U	U	H	H	L	M	L
Oil & Grease	M	M	U	U	L	H	L
Pesticides	U	U	U	L	L	U	L

(1) Copermittees are encouraged to periodically assess the performance characteristics of many of these BMPs to update this table.
(2) Including trenches and porous pavement.
(3) Also known as hydrodynamic devices and baffle boxes.

L: Low removal efficiency):
M: Medium removal efficiency):
H: High removal efficiency):
U: Unknown removal efficiency

Sources: *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (1993), *National Stormwater Best Management Practices Database* (2001), *Guide for BMP Selection in Urban Developed Areas* (2001), *and Caltrans New Technology Report (2001).*

4.1 Site Design BMPs

Priority projects shall be designed so as to minimize, to the maximum extent practicable, the introduction of pollutants and conditions of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. Priority projects shall also control post-development peak stormwater runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion and to protect stream habitat. Although not mandatory, priority projects can address these objectives through the creation of a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the storm water conveyance system, and minimizing clearing and grading.

- Providing runoff storage measures dispersed uniformly throughout a site's landscape with the use of a variety of detention, retention, and runoff practices.
- Implementing on-lot hydrologically functional landscape design and management practices.

These design principles offer an innovative approach to urban storm water management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates storm water controls throughout the urban landscape. Useful resources for applying these principles, referenced in Chapter 7, include *Start at the Source* (1999), and *Low-Impact Development Design Strategies* (1999).

Principle 1: Objective: Maintain Pre-Development Rainfall Runoff Characteristics

If practicable, priority projects shall control post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development development downstream erosion. In addition, projects should control runoff discharge volumes and durations to the maximum extent practicable using the site design, source control, and treatment control requirements.

Measures to control flow rates and velocities shall not disrupt flows and flow patterns that are necessary to support downstream wetlands or riparian habitats. Diversion of runoff to regional facilities shall not be allowed to deprive immediate downstream habitats of the minimum flows and /or over-bank flow events they need.

Mitigation structures put in place to control peak runoff flow rates and velocities shall be designed for a 10-year 6-hour storm event.

Design Concept 1: Minimize Project's Impervious Footprint & Conserve Natural Areas

The following site design options shall be considered, incorporated and implemented where determined applicable and feasible, during the site planning and approval process, consistent with applicable planning policies and other development regulations.

1. Minimize impervious footprint. This can be achieved in various ways, including:
   a.) Construct walkways, trails, patios, and alleys and other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.
   b.) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary.

c.) Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
d.) Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
e.) Increasing building density (number of stories above or below ground)
f.) Use natural drainage systems to the maximum extent practicable.

2. Conserve natural areas where feasible. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. The following list, which is in order of increasing sensitivity, provides a guideline for determining the least sensitive portions of the site.
   a.) Areas devoid of vegetation, including previously graded areas and agricultural fields.
   b.) Areas of non-native vegetation, disturbed habitats and eucalyptus woodlands.
   c.) Areas of chamise or mixed chaparral, and non-native grasslands.
   d.) Areas containing coastal scrub communities.
   e.) All other upland communities.
   f.) Occupied habitat of sensitive species and all wetlands.
   g.) All areas necessary to maintain the viability of wildlife corridors.
   h.) Within each of the previous categories, areas containing hillsides (as defined in this Model SUSMP) should be considered more sensitive than the same category without hillsides.
   i.) Construct walkways, trails, patios, overflow parking lots and alleys and other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.
   j.) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.
   k.) Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
   l.) Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
   m.) Use natural drainage systems to the maximum extent practicable.
   n.) Other site design options that are comparable, and equally effective.

Design Concept 2: Minimize Directly Connected Impervious Areas (DCIAs)

Priority projects shall consider, and incorporate and implement the following design characteristics, where determined applicable and feasible.

a.) Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.
b.) Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.
c.) Other design characteristics that are comparable and equally effective.

Principle 2: Protect Slopes and Channels

Project plans shall include stormwater BMPs to decrease the potential for erosion of slopes and/or channels, consistent with local codes and ordinances and with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers, the San Diego Regional Water Quality Control Board, and the California Department of Fish and Game. The following design principles shall be considered, and incorporated and implemented where determined applicable and feasible by the County:

a.) Convey runoff safely from the tops of slopes.
b.) Vegetate slopes with native or drought tolerant vegetation.
c.) Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
d.) Stabilize permanent channel crossings.
e.) Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
f.) Where measures (a) through (e) are not achievable, "Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.
g.) Other design principles that are comparable and equally effective.

4.2 Source Control BMPs

The second level of BMPs that must be addressed are source control BMPs.

Principle 3: Provide Storm Drain System Stenciling and Signage

Storm drain stencils or tiles are highly visible source control messages, typically placed directly adjacent to storm drain inlets. The stencils or tiles contain a brief statement that prohibits the dumping of improper materials into the urban runoff conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message. Storm drain inlets and access points to creeks and channels must be

marked to discourage illegal dumping, with markings indicating the receiving water by name. Specifically:

a) All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language (such as: "NO DUMPING – I LIVE IN <<name receiving water>>") and/or graphical icons to discourage illegal dumping.

b) Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.

c) Legibility of stencils, tiles and signs must be maintained and tiles must be placed flush with the top of concrete to reduce tripping by pedestrians

Principle 4: Design Outdoors Material Storage Areas to Reduce Pollution Introduction

Outdoor materials storage areas must be properly designed. Personal storage areas at detached single-family residences are exempt from this requirement.

Improper storage of materials outdoors may increase the potential for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the urban runoff conveyance system. Where the priority project plans include outdoor areas for storage of hazardous materials that may contribute pollutants to the urban runoff conveyance system, the following storm water BMPs are required:

a.) Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
b.) The storage area shall be paved and sufficiently impervious to contain leaks and spills.
c.) The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.

Principle 5: Design Trash Storage Areas to Reduce Pollution Introduction

All outdoor trash container areas shall meet the following requirements (limited exclusion: detached residential homes). A "trash container area" refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

a.) Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; and,
b.) Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.

Principle 6: Use Efficient Irrigation Systems & Landscape Design

Priority projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water conveyance system. (Limited exclusion: detached residential homes.) The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible:

a.) Employing rain shutoff devices to prevent irrigation after precipitation.
b.) Designing irrigation systems to each landscape area's specific water requirements.
c.) Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
d.) Employing other comparable, equally effective, methods to reduce irrigation water runoff.

Principle 7: Incorporate Requirements Applicable to Individual Priority Project Categories

Where identified in Table 4.2, the following requirements shall be incorporated into applicable priority projects during the storm water BMP selection and design process. Projects shall adhere to each of the individual priority project category requirements that apply to the project (e.g., a restaurant with more than 15 parking spaces would be required to incorporate the requirements for " g. Equipment Wash Areas and "h. Parking Areas" into the project design).

a. Private Roads

The design of private roadway drainage shall use at least one of the following (for further guidance, see *Start at the Source* [1999]):

1. Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings;
2. Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter;
3. Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.

4. Other methods that are comparable and equally effective within the project.

b. Residential Driveways & Guest Parking

The design of driveways and private residential parking areas shall use one at least of the following features.

1. Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.
2. Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.
3. Other features which are comparable and equally effective.

c. Dock Areas

Loading/unloading dock areas shall include the following:

1. Cover loading dock areas, or design drainage to preclude urban run-on and runoff.
2. Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.
3. Other features which are comparable and equally effective.

d. Maintenance Bays

Maintenance bays shall include of the following:

1. Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff; and
2. Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

OR

3. Other features which are comparable and equally effective.

e. Vehicle Wash Areas

Priority projects that include areas for washing/steam cleaning of vehicles shall use the following:

1. Self-contained; or covered with a roof or overhang;

2. Equipped with a clarifier or other pretreatment facility;
3. Properly connected to a sanitary sewer.
4. Other features which are comparable and equally effective.

f. Outdoor Processing Areas

Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements.

1. Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.
2. Grade or berm area to prevent run-on from surrounding areas.
3. Installation of storm drains in areas of equipment repair is prohibited.
4. Other features which are comparable or equally effective.

g. Equipment Wash Areas

Outdoor equipment/accessory washing and steam cleaning activities at priority projects shall use the following:

1. Be self-contained; or covered with a roof or overhang;
2. Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate;
3. Be properly connected to a sanitary sewer.
4. Other features which are comparable or equally effective.

h. Parking Areas

To minimize the offsite transport of pollutants from parking areas, the following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County:

1. Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.
2. Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.
3. Other design concepts that are comparable and equally effective.

i Roadways

Priority roadway projects shall select treatment control BMPs following the enhanced treatment control selection procedure identified in this chapter.

j. Fueling Area

Non-retail fuel dispensing areas shall contain the following:

1. Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.
2. Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.
3. Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.
4. At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

k. Hillside Landscaping

Hillside areas, as defined in this SUSMP, that are disturbed by project development shall be landscaped with deep-rooted, drought tolerant plant species selected for erosion control, satisfactory to the County.

4.3 Treatment Control BMPs

Minimizing a development's detrimental effects on water quality can be most effectively achieved through the use of a combination of site design, source and treatment control storm water BMPs. Where projects have been designed to minimize, to the maximum extent practicable, the introduction of anticipated pollutants of concern that may result in significant impacts to the receiving waters through the implementation of site design and source control storm water BMPs, the development would still have the potential for pollutants of concern to enter the storm water conveyance system. Therefore, priority projects shall be designed to remove pollutants of concern from the storm water conveyance system to the maximum extent practicable through the incorporation and implementation of treatment control BMPs.

In meeting the requirements in this section, priority projects shall implement a single or combination of storm water BMPs that will remove anticipated pollutants of concern, as identified by the procedure in Chapter 3, in site runoff to the maximum extent practicable. Treatment control BMPs must be implemented unless the County based on the infeasibility of any treatment control BMP grants a waiver to the project. Additional information regarding the waiver is discussed in Chapter 6.

Principle 8: Design to Treatment Control BMP Standards

All priority projects shall design, construct and implement structural treatment control BMPs that meet the design standards of this chapter, unless specifically exempted by the limited exclusions listed at the end of this principle. Structural treatment control BMPs required by this chapter shall be operational prior to the use of any dependent development, and shall be located and designed in accordance with the requirements here in Principle 8 and below in Principle 9.

Volume

1. Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

   i. The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record[6]; or

   ii. The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998*); or

   iii. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event,[7]

OR

[6]. This volume is not a single volume to be applied to all of San Diego County. The size of the 85th percentile storm event is different for various parts of the County. The project proponent or County staff may calculate the 85th percentile storm event using local rain data. In addition, isopluvial maps contained in the County of San Diego Hydrology Manual may be used to extrapolate rainfall data to areas where insufficient data exists. If isopluvial maps are selected, the project proponent or County staff shall describe their method for using isopluvial maps in their Jurisdictional SUSMP.

[7]. Under this volume criterion, hourly rainfall data may be used to calculate the 85th percentile storm event, where each storm event is identified by its separation from other storm events by at least six hours of no rain. If hourly rainfall data is selected, the project proponent or County staff shall describe the method using hourly rainfall data in their Jurisdictional SUSMPs.

Flow

2. Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

   i. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour for each hour of a storm event; or

   ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or

   iii. The maximum flow rate of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

Limited Exclusions:

1. Proposed restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical sizing criteria requirements listed in Section 4.3, Principle 8.
2. Where significant redevelopment results in an increase of less than 50 percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in Section 4.3, Principle 8 apply only to the addition, and not to the entire development.

Principle 9: Locate BMPs Near Pollutant Sources

Structural treatment control storm water BMPs should be implemented close to pollutant sources to minimize costs and maximize pollutant removal prior to runoff entering receiving waters. Such BMPs may be located on- or off-site, used singly or in combination, or shared by multiple new developments, pursuant to the following requirements:

1. All structural treatment control BMPs for priority development projects shall be located so as to infiltrate, filter, and/or treat the required runoff volume or flow prior to its discharge to any receiving water;
2. Multiple post-construction structural treatment control BMPs for a single priority development project shall collectively be designed to comply with the design standards of Principle 8;
3. Shared stormwater BMPs shall be operational prior to the use of any dependent development or phase of development. The shared BMPs shall only be required to treat the dependent developments or phases of development that are in use;
4. Interim stormwater BMPs that provide equivalent or greater treatment than

is required by Principle 8 may be implemented by a dependent development until each shared BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.

Principle 10: Restrictions on Use of Infiltration BMPs

Three factors significantly influence the potential for urban runoff to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in urban runoff, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of urban runoff. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

The use of infiltration BMP (such as infiltration trenches and infiltration basins) can only be considered if bioswales or extended detention basins have been precluded for use as a treatment BMP. An extensive site study as outline in Appendix F shall be conducted prior to the acceptance of an infiltration BMP. As additional ground water basin data is obtained, the County may develop additional restrictions on the use of any BMPs that allow incidental infiltration. At a minimum, use of structural treatment BMPs that are designed to primarily function as infiltration devices shall meet the following conditions[8]:

1. Urban runoff from commercial developments shall undergo pretreatment to remove both physical and chemical contaminants, such as sedimentation or filtration, prior to infiltration.
2. All dry weather flows shall be diverted from infiltration devices except for those non-storm water discharges authorized pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1): diverted stream flows, rising ground waters, uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to storm water conveyance systems, uncontaminated pumped ground water, foundation drains, springs, water from crawl space pumps, footing drains, air conditioning condensation, flow from riparian habitats and wetlands, water line flushing, landscape irrigation, discharges from potable water sources other than water main breaks, irrigation water, individual residential car washing, and dechlorinated swimming pool discharges.
3. These BMPs shall not be used when infiltration rates are less than 0.5 inch per hour, as defined by the least permeable layer in the shallow soil profile. This excludes most “C” and “D” soils (Standard Soil Classification System), which cannot percolate enough runoff through the subsoil.

[8]. These conditions do not apply to structural treatment BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.)

Extremely permeable sandy soils may not maintain adequate water levels in wet ponds.

4. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural treatment BMPs are to be used.
5. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet. Where groundwater does not support beneficial uses, this vertical distance criterion may be reduced, but cannot be less than 4 feet, provided groundwater quality is maintained.
6. The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) that are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.
7. Infiltration structural treatment BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as determined by the County.
8. Infiltration BMPs must be designed to completely drain within 72 hours after a storm. If the infiltration rates of the underlying soils are slow, depth and footprint of the infiltration BMP must be adjusted to achieve this standard.
9. The horizontal distance between the base of any infiltration structural BMP and any water supply wells shall be 100 feet or as determined on an individual, site-specific basis by the County.
10. Infiltration BMPs may be clogged by large loads of sediment generated during construction, and shall not be installed until all of the land to be disturbed by construction is effectively and permanently stabilized. To prevent clogging after construction, a pre-treatment device must be used to filter sediment and other coarse particles before they reach the infiltration BMP.

Where infiltration BMPs are authorized, their performance shall be evaluated for impacts on groundwater quality. Including the potential impact to groundwater in another jurisdiction. Consideration shall be made to the Municipal Permit Section D.1.g. requirements to control the contribution of pollutants from one portion of the watershed to another portion of the watershed through interagency agreements among the Copermittees. In those instances where the County has determined that implementation of proposed infiltration BMPs has a potential impact to groundwater quality in another jurisdiction, the infiltration BMP will be taken offline. A study will be conducted to determine the feasibility of replacing the infiltration BMP with non-infiltrating treatment BMP.

4.4 Alternative Methods of Achieving Treatment Requirements

The County may implement Local Equivalent Area Drainage (LEAD) Method, as proposed by the City of San Diego in its May 16, 2002 letter (Appendix G), for meeting the BMP requirements in Section 4.3, Principle 8, "Design to Treatment Control BMP Standard". The alternative method must minimally meet the following criteria:

- Alternative treatments shall be limited to redevelopment and/or infill projects.
- The alternative treatment area shall be located within the proximity of the project;
- The alternative treatment area shall discharge to the same receiving water as the project;
- The alternative treatment area shall be equivalent or greater than the project footprint;
- The alternative treatment area shall have an equivalent or greater impervious surface area than the project;
- The alternative treatment area shall have an equivalent or greater pollutant load than the project;
- Site Design and Source Control BMPs (Sections VI.2.a & b) shall be required in the project design.

The alternative method can only be implemented for no more than three pilot projects during this permit cycle. For each project where an alternative method is implemented, the effectiveness of the alternative method shall be monitored and reported on to the Regional Board by the end of the permit cycle.

4.5 Process for Capital Improvement Projects

The process for incorporating permanent BMPs into CIPs is the same as those for private land development projects. The acceptable BMPs are the same as well. Additional guidance for the selection and design of permanent BMPs for CIPs is available in Section 4 of the *Caltrans Storm Water Quality Handbooks, Project Planning and Design Guide (September 2002)* and the *California Stormwater Quality Task Force Best Management Practices Handbooks*.

4.6 Acceptable Urban BMP Options

The following are a list of BMPs that may be used to minimize the introduction of pollutants of concern that may result in significant impacts to receiving waters. Other BMPs approved by the County as being equally or more effective in pollutant reduction than comparable BMPs identified below are acceptable. See Section 8: *Resources and References* for additional sources of information. All BMPs must comply with local zoning and building codes and other applicable regulations.

4.6.1 Site Design BMPs

Minimizing Impervious Areas

- Reduce sidewalk widths as long as ADA requirements are met.
- Incorporate landscaped buffer areas between sidewalks and streets.
- Design residential streets for the minimum required pavement widths.
- Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.
- Use open space development that incorporates smaller lot sizes.
- Increase building density while decreasing the building footprint.
- Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Reduce overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using porous pavement materials in spillover parking areas.

Increase Rainfall Infiltration

- Use permeable materials for private sidewalks, driveways, parking lots, and interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the urban runoff conveyance system.

Maximize Rainfall Interception

- Maximizing canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.

Minimize Directly Connected Impervious Areas (DCIAs)

- Draining rooftops into adjacent landscaping prior to discharging to the storm drain
- Draining parking lots into landscape areas co-designed as biofiltration areas
- Draining roads, sidewalks, and impervious trails into adjacent landscaping

Slope and Channel Protection

- Use of natural drainage systems to the maximum extent practicable.
- Stabilized permanent channel crossings.
- Planting native or drought tolerant vegetation on slopes.
- Energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels.

Maximize Rainfall Interception
- Cisterns
- Foundation planting

Increase Rainfall Infiltration
- Dry wells *(Only in projects with hydrologic soil groups A and B and with 10 feet minimum separation between the well invert and seasonal high groundwater level.)*

4.6.2 Source Control BMPs

- Storm drain system stenciling or tiling and signage.
- Outdoor material and trash storage area designed to reduce or control rainfall runoff.
- Efficient irrigation system.

4.6.3 Treatment Control BMPs

There are 24 different BMP designs currently approved for use in the County. These BMPs are assigned into seven general categories for stormwater quality control.

Biofilters
- Grass swale
- Grass strip
- Wetland vegetation swale
- Bioretention

Detention Basins
- Extended/dry detention basin with grass lining
- Extended/dry detention basin with impervious lining

Infiltration
- Infiltration basin
- Infiltration trench
- Porous asphalt
- Porous concrete
- Porous modular concrete block

Wet Ponds and Wetlands
- Wet pond/basin (permanent pool)
- Constructed wetland

Drainage Inserts
- Oil/Water separator

- Catch basin insert
- Storm drain inserts
- Catch basin screens

Filtration Systems
- Media filtration
- Sand filtration

Hydrodynamic Separation Systems
- Swirl Concentrator
- Cyclone Separator
- Baffle Separator
- Gross Solids Removal Device
- Linear Radial Device

5.0 Maintenance Requirements for Treatment BMPs

This chapter provides guidelines for preparation of a Stormwater Maintenance Plan (SMP) for any structural treatment BMPs associated with discretionary project. The SMP is prepared by the proponent and incorporated in the project SWMP.

The effectiveness of the SWMP relies partially on maintenance of any Structural Treatment BMPs proposed for a project. The performance of permanent BMPs is dependent on the maintenance efforts conducted to ensure its ability to treat pollutant loads. The WPO obligates dischargers, and owners and occupants of land to maintain all structural treatment BMPs that are part of their project. The County shall not consider structural BMPs "effective," and therefore shall not accept storm water BMPs as meeting the MEP standard, unless a mechanism is in place that will ensure ongoing long-term maintenance of all structural BMPs.

The SMP describes the responsibilities for the care and upkeep of these permanent BMPs. Improper or inadequate maintenance of this type of BMP could impact storm water and receiving water quality. The SMP is the component of the SWMP that describes:

- The program to maintain permanent structural treatment BMPs including frequency and type of maintenance, safety precautions, and reporting/record keeping.
- The program to implement maintenance of these BMPs may be included as part of other ongoing maintenance activities for the project.
- Maintenance activities must include information and responses concerning potential storm water pollution from accidental spills, illicit connections, illegal discharges and illegal dumping within the Structural Treatment BMPs.
- On-going funding for the proposed maintenance activities.

Early consideration and planning of maintenance efforts ensures that water quality will be addressed for many years to come. Development of a SMP is required when submitting the Project Application if the proposed project includes Structural Treatment BMPs. In addition, the SMP must meet with County approval and is a living document, which could require changes during project development.

Structural Treatment BMPs that must be maintained include but are not limited to the following:

1. Biofilters
2. Detention Basins
3. Infiltration BMP
4. Wet Ponds and Wetlands
5. Storm Drain Inserts, Oil/Water separator, Catch basin insert & screens.
6. Filtration Systems

7. Hydrodynamic Separators

5.1 Proof of a Mechanism to Ensure Maintenance of Treatment BMPs

As part of project review, if a project proponent is required to include interim or permanent structural BMPs in project plans, and if the SWMP does not provide a mechanism for BMP maintenance, the County will require that the applicant provide verification of maintenance requirements through such means as may be appropriate, at the discretion of the County, including, but not limited to covenants, legal agreements, maintenance agreements, and/or conditional use permits. The project proponent is required to provide a signed statement acknowledging responsibility for structural BMP maintenance, repair and replacement until the County accepts an alternative mechanism to ensure such maintenance, repair and replacement.

Potentially acceptable mechanisms for ensuring BMP maintenance includes the following:

(a) County maintenance. The County may agree to accept ownership of and to maintain the BMP, under such conditions as it deems appropriate.

(b) Maintenance by another public entity. The County may agree that another public or acceptable quasi-public entity (e.g., the County Flood Control District, a state or federal resource agency, or a conservation conservancy) may assume responsibility for maintenance, repair and replacement of the BMP in lieu of the developer. The County may require that some or all estimated maintenance costs be front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the County may seek protection from liability by appropriate releases and indemnities.

    The developer must provide any public entity accepting maintenance obligations sufficient ownership or easement interests to allow maintenance, repair and replacement of BMPs. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until the County or other public entity accepts them. Structural BMPs proposed for transfer to any other public entity must be approved by the County prior to installation. The County shall be involved in the negotiation of maintenance requirements with any other public entities accepting maintenance responsibilities. The County must be identified as a third party beneficiary empowered to enforce any such maintenance agreement.

(c) Maintenance by a subsequent owner. The County may agree that sufficient assurance of maintenance is provided by the responsibility the WPO imposes on subsequent owners of the BMP to maintain that BMP. The County may decline to accept this mechanism as an adequate developer assurance if the County concludes in its sole discretion that any

subsequent owner(s) may be unable or unwilling to maintain, repair or replace the BMP despite the legal obligation to do so. The County may condition acceptance of this mechanism on a backup agreement with the developer, a related natural person to ultimately be accountable to the County to pay all costs for BMP maintenance, repair or replacement if a subsequent owner fails to perform. Acknowledgements or responsibility or other contractual agreement with the subsequent owners may also be required.

(d) County Service Area or Assessment District. The developer can create a County Service Area (CSA) or other funding mechanism to provide funds for BMP maintenance, repair and replacement on an ongoing basis. If that mechanism could be compromised or eliminated by any subsequent vote, the County may condition acceptance of this mechanism on an agreement that would preclude such compromise or elimination, and/or on a backup agreement with the developer or a related natural person to ultimately be accountable to the County to pay all costs for BMP maintenance, repair or replacement if funding and maintenance by a CSA or Assessment District proved to be inadequate for any reason.

(e) Lease provisions. In those cases where the County holds title to the land in question, and the land is being leased to another party for private or public use, the County may assure storm water BMP maintenance, repair and replacement through conditions in the lease.

(f) Conditional use permits. For discretionary projects that require a use permit, the County may agree that the inclusion of appropriate terms in the use permit will provide sufficient assurance maintenance of storm water BMPs. The County may condition acceptance of this mechanism on a backup agreement with the developer or a related natural person to ultimately be accountable to the County to pay all costs for BMP maintenance, repair or replacement if a subsequent owner fails to perform.

(g) Other mechanisms. The County in its discretion may accept other mechanisms for ensuring BMP maintenance, repair and replacement.

5.1.1 Right to Condition Acceptance of any Proposed Mechanism

The County in its discretion may decline to accept any proposed mechanism for assuring BMP maintenance, repair or replacement that is not supported by an adequate and reliable source of funds. The County in its discretion may also require that any such proposed mechanism be supported by back up agreements including but not limited to a back-up maintenance agreement with the developer or a related natural person.

5.2 Guidelines for Maintenance Plan Development

Maintenance activities or programs must be specified in sufficient detail for a third party to easily determine the actions necessary. The following items are required for the project SMP:

a. Information concerning the maintenance for each Post-construction Structural Treatment BMP, including routine actions, maintenance indicators, field measurement, measurement frequency, maintenance activity, and site-specific requirements;
b. Proposed provisions for monitoring of BMP and provisions for County compliance inspections;
c. List of indicator thresholds that will trigger maintenance activity.
d. Maintenance Activities Checklist;
e. Proposed methods of disposing of sediment and collected pollutants.
f. Cost estimate for annual maintenance activities, and;
g. Proposed mechanism for on-going funding of maintenance activities per section 5.4.

Specific format and guidelines are included within Appendix C. In addition, Appendix H includes maintenance task and associated cost. The project proponent, at their discretion, can use this data as a preliminary estimate for the maintenance efforts needed for the project. Above items may be shown on other application documents such as the tentative map, preliminary grading plan, or preliminary drainage study. If this is done, the SWMP document must identify where each of these component pieces can be found.

Applicants must propose for County determination the appropriate maintenance mechanism for selected BMPs. The BMPs should fit into one of the following categories:

FIRST CATEGORY:

The County should have only minimal concern for ongoing maintenance. The proposed BMPs inherently "take care of themselves", or property owners can naturally be expected to do so as an incident of taking care of their property

Typical BMPs:

- Biofilters (Grass swale, Grass strip, vegetated buffer)
- Infiltration BMP (basin, trench)

Mechanisms to Assure Maintenance:

1. Stormwater Ordinance Requirement: The WPO requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.

2. Public Nuisance Abatement: Under the WPO failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.
3. Notice to Purchasers. Section 67.819(e) of the WPO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.
4. Conditions in Ongoing Land Use Permits: For those applications (listed in SO Section 67.804) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the SMP. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.
5. Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)

Funding:
None Required.

SECOND CATEGORY:

The County needs to assure ongoing maintenance. The nature of the proposed BMPs indicates that it is appropriate for property owners to be given primary responsibility for maintenance, on a perpetual basis (unless a stormwater utility is eventually formed). However, the County (in a "backup" role) needs to be able to step in and perform the maintenance if property owner fails, and needs to have security to provide funding for such backup maintenance. Security for "backup" maintenance after the interim period (5 years) would not be provided, however primary owner maintenance responsibility would remain. If a stormwater utility or other permanent mechanism is put into place, it could assume either a primary or backup maintenance role.

Typical BMPs:

- Biofilters;
- Small Detention Basins;

- Infiltration BMP, and;
- Single Storm Drain Inserts, Oil/Water separator, Catch basin insert & screens.

Mechanisms to Assure Maintenance:

1. Stormwater Ordinance Requirement: The WPO requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.
2. Public Nuisance Abatement: Under the WPO failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.
3. Notice to Purchasers. Section 67.819(e) of the WPO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.
4. Conditions in Ongoing Land Use Permits: For those applications (listed in WPO Section 67.804) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the SMP. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.
5. Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)
6. BMP Maintenance Agreement with Easement and Covenant: An agreement will be entered into with the County, which will function three ways:
   (a) It will commit the land to being used only for purposes of the BMP;
   (b) It will include an agreement by the landowner, to maintain the facilities in accordance with the SMP (this obligation would be passed on to future purchasers or successors of the landowner, as a covenant); and

(c) It will include an easement giving the County the right to enter onto the land (and any necessary adjacent land needed for access) to maintain the BMPs.

This would be required of all applications listed in WPO Section 67.804. In the case of subdivisions, this easement and covenant would be recorded on or prior to the Final or Parcel Map.

Funding:

Developer would provide the County with security to substantiate the maintenance agreement, which would remain in place for an interim period of 5 years. The amount of the security would equal the estimated cost of 2 years of maintenance activities. The security can be a Cash Deposit, Letter of Credit or other form acceptable to the County.

THIRD CATEGORY:

The County needs to assure ongoing maintenance is heightened, to the point that the County is willing to take on this responsibility. A permanent funding mechanism needs to be established.

Typical BMPs:

- Biofilters
- Detention Basins
- Infiltration BMP
- Wet Ponds and Wetlands
- Multiple Storm Drain Inserts, Oil/Water separators, Catch basin insert & screens.
- Filtration Systems
- Hydrodynamic Separators

Mechanisms to Assure Maintenance:

1. Dedication of BMP to County: The developer would be required to dedicate the BMP (and the property on which it is located) to the County. This could be an immediate dedication, or for cases where the County would not want to assume responsibility for the facility for some time (e.g., until after construction is completed), then an IOD could be used instead.
2. County Maintenance Documentation: Where the County has assumed maintenance responsibility, internal County program documentation would memorialize the required maintenance.

Funding:

The primary funding mechanism will be a special assessment under the authority of the Flood Control District. The assessment will be collected with property tax. Because this primary funding mechanism will require substantial amount of time

to establish and collect assessments, a developer fee will be needed to cover the initial maintenance period of 24 months.

FOURTH CATEGORY

Proposed BMPs that are recognized from the beginning as deserving of public ownership and maintenance; normally, these would serve a public need and benefit larger in scope than an individual development project.

Typical BMPs:

- Biofilters
- Detention Basins
- Wet Ponds and Wetlands
- Retrofit public Storm Drain Inserts, Oil/Water separator, Catch basin insert & screens.
- Filtration Systems
- Hydrodynamic Separators

Mechanisms to Assure Maintenance:

1. Dedication of BMP to County: The developer would be required to dedicate the BMP (and the property on which it is located) to the County. This could be an immediate dedication, or for cases where the County would not want to assume responsibility for the facility for some time (e.g., until after construction is completed), then an IOD could be used instead.
2. County Maintenance Documentation: Internal County or Flood Control District maintenance program documentation would memorialize the required maintenance.

Funding:

A permanent source will be implemented; options include gas tax, TransNet, General Fund, or new special taxes or fees.

5.2.1 Determination of Appropriate Maintenance Mechanism(s):

Table 5.1 outlines the appropriate determination of public / private responsibility, and mechanism(s) for each of the four categories.

Table 5.1 Determinations of Appropriate Maintenance Mechanism(s)

Increased risk, complexity, cost or other maintenance factors				
(Private Responsibility)			(Public Responsibility)	
	First Category	**Second Category**	**Third Category**	**Fourth Category**
Importance of Maintenance	Minimal concern; inherent in BMP or property stewardship	Need to make sure private owners maintain, and provide County ability to step in & perform maintenance	Warrants Flood Control Dist. (FCD) assuming responsibility, with funding related to project	Broader public responsibility for maintenance and funding (beyond project)
Typical BMPs	Biofilter (Grass swale, grass strip, vegetated buffer); Infiltration basin/trench	[First cat. plus:] Minor wetland swale; Small detention basin; Single storm drain insert / Oil-water separator / Catch basin insert & screen	[Second cat. plus:] Wetland swale or bioretention; Detention basin (extended/dry); Wet ponds & wetlands; Multiple storm drain inserts; Filtration Systems	[Third cat. plus:] Retrofit public storm drain inserts, etc. Master plan facility that serves area larger than project
Mechanisms	1. Stormwater Ordinance[9] requirement [section 67.819(a)&(b)], with code enforcement 2. Nuisance abatement with costs charged back to property owner 3. Condition in ongoing permit such as a Major Use Permit (if project has MUP) 4. Notice to new purchasers [67.819(e)] 5. Subdivision public report "white papers" to include notice of maintenance responsibility	6. Recorded easement agreement w/covenant binding on successors	1. Dedication to FCD. 2. Formation of benefit area 3. FCD maintenance documentation	1. Dedication to FCD or County. 2. FCD / County maintenance documentation
Funding Source(s)	None necessary	Security (Cash deposit, Letter of Credit, or other acceptable to County) for interim period. Agreement for security to contain provisions for release or refund, if not used.	**Start-up interim:** Developer fee covering 24 months of costs **Permanent:** FCD Assessment per FCD Act Sec 105-17.5	Varies: gas tax for BMP in road ROW, Transnet for CIP projects, Special funding or General funding for others.

5.3 County Review of Maintenance Plan

County staff reviews the SMP as part of the overall project application and for compliance with the WPO and SSM. These reviews include the departments of Public Works for engineering and cost estimates and Planning & Land Use for environmental concerns. Information from the SMP shall be used in formulating CEQA responses and findings, findings of project code compliance, and in

[9] County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (S.D.Co.Code Sec. 67.801 et seq.) BC Draft 4-26-02

proposing conditions for the project. The County has the final authority for deciding what is required in the SMP and when a proposed SMP is adequate.

Staff reviewing the maintenance proposals will pay careful attention to the BMPs proposed, to:

(a) Select the appropriate BMPs in view of ongoing maintenance costs; and

(b) Determine whether it is appropriate for the BMPs to remain in private ownership and responsibility, or to be taken over by the County (or Flood Control District).

6.0 Waiver of Structural Treatment BMP Requirements

The County may grant a waiver from the requirement of implementing structural treatment BMPs (Section 4.3, "Design to Treatment Control BMP Standards") if infeasibility can be established. The County shall only grant a waiver of infeasibility when all available structural treatment BMPs have been considered and rejected as infeasible. The County shall notify the Regional Board within 5 days of each waiver issued and shall include the name of the person granting each waiver.

The proponent must show to the County that the treatment BMPs is infeasible based on Relative Effectiveness, Technical Feasibility, Costs and Benefits, and Legal and Institutional Constraints.

Relative Effectiveness: A recommended BMP should generally demonstrate equal or greater pollution control benefits than a design without any BMP. Effectiveness may be assessed in terms of specific pollutants of concern (e.g., sediment or trash) or groups of pollutants. If there are no existing pollution or water quality control measures currently being implemented, then the recommended BMP will be considered effective by default.

Technical Feasibility: A recommended BMP must be technically feasible. The project must be able to implement the BMP within the context of the type of development. Feasibility also includes health and safety concerns. BMPs that substantially increase the risk to County staff or the public will be considered not feasible.

Costs and Benefits: The pollution control benefits must have a reasonable relationship to the costs. The costs and benefit analysis will consider the impacts to the waters of the State that are being mitigated or controlled through implementing the County's JURMP.

Legal and Institutional Constraints: The recommended BMP cannot compromise the County's compliance with other laws. For example, the County requires for drainage to be provided under roadways at regular intervals to prevent water from accumulating upgradient and threatening the integrity of the roadbed and to limit encroachment of captured water on the traveled way. The County cannot legally block historic drainage patterns or systems.

Waivers may only be granted from structural treatment BMP and structural treatment BMP sizing requirements. Priority development projects, whether or not granted a waiver may not cause or contribute to an exceedance of water quality objectives. Pollutants in runoff from projects granted a waiver must still be reduced to the maximum extent practicable.

7.0 Site Design Stormwater Treatment Credits

The Model SUSMP allows any Copermittee to implement a Site Design Stormwater Treatment Credit program. This kind of program specifies the conditions under which project proponents can be credited for the use of site design features and low impact development techniques that can reduce the volume of storm water runoff, preserve natural areas, and minimize the pollutant loads generated and potentially discharged from the site. The credit granted is a reduction in the volume or flow of storm water that must be captured or treated on a project.

The County anticipates that it will implement a Site Design Stormwater Treatment Credit program in the future. However, a model program must first be jointly developed by the Copermittees, and approved by the Regional Board.

8.0 Resources and References

SUGGESTED RESOURCES	HOW TO GET A COPY
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org
California Urban runoff Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959
Caltrans Urban runoff Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (2000) Presents guidance for design of urban runoff BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different urban runoff-filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Development Planning for Stormwater Management, A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), (May 2000)	Los Angeles County Department of Public Works http://dpw.co.la.ca.us/epd/ or http://www.888cleanLA.com
Florida Development Manual: A Guide to Sound Land and Water Management (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Guide for BMP Selection in Urban Developed Areas *(2001)*	ASCE Envir. and Water Res. Inst. 1801 Alexander Bell Dr. Reston, VA 20191-4400 (800) 548-2723

SUGGESTED RESOURCES	HOW TO GET A COPY
Low-Impact Development Design Strategies - An Integrated Design Approach *(June 1999)*	Prince George's County, Maryland Department of Environmental Resource Programs and Planning Division 9400 Peppercorn Place Largo, Maryland 20774 http://www.co.pg.md.us/Government/DER/PPD/pgcounty/lidmain.htm
Maryland Stormwater Design Manual (1999) Presents guidance for designing urban runoff BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
National Stormwater Best Management Practices (BMP) Database, Version 1.0 Provides data on performance and evaluation of urban runoff BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000
National Stormwater Best Management Practices Database *(2001)*	*Urban Water Resources Research Council of ASCE* *Wright Water Engineers, Inc.* *(303) 480-1700*
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at storm water practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration	*Report No. EPA/600/R-94/051, USEPA (1994).*
Preliminary Data Summary of Urban runoff Best Management Practices (August 1999) *EPA-821-R-99-012*	http://www.epa.gov/ost/stormwater/
Reference Guide for Stormwater Best Management Practices *(July 2000)*	City of Los Angeles Urban runoff Management Division 650 South Spring Street, 7th Floor Los Angeles, California 90014 http://www.lacity.org/san/swmd/

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 (818) 623-4848 Fax (818) 753-4625
Start at the Source (1999) Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Stormwater, Grading and Drainage Control Code, Seattle Municipal Code Section 22.800-22.808, and Director's Rules, Volumes 1-4. (Ordinance 119965, effective July 5, 2000)	City of Seattle Department of Design, Construction & Land Use 700 5th Avenue, Suite 1900 Seattle, WA 98104-5070 (206) 684-8880 http://www.ci.seattle.wa.us/dclu/Codes/sgdccode.htm
Texas Nonpoint Source Book – Online Module (1998)www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Urban runoff Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150
The Practice of Watershed Protection by Thomas R. Shchuler and Heather K. Holland	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org
Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277